

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Atty. Docket No: 078728/0106

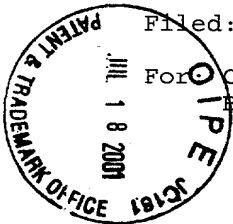
In re patent application of

ROBERTS, JOSEPH et al.

Serial No. 09/833,745

Filed: April 13, 2001

For CLONING, OVEREXPRESSION AND THERAPEUTIC USE OF  
BIOACTIVE HISTIDINE AMMONIA LYASE



STATEMENT TO SUPPORT FILING AND SUBMISSION IN  
ACCORDANCE WITH 37 C.F.R. §§ 1.821-1.825

Assistant Commissioner for Patents  
Washington, D.C. 20231  
**Box SEQUENCE**

Sir:

In connection with a Sequence Listing submitted concurrently  
herewith, the undersigned hereby states that:

1. the submission, filed herewith in accordance with 37  
C.F.R. § 1.821(g), does not include new matter;

2. the content of the attached paper copy and the  
attached computer readable copy of the Sequence Listing, submitted in  
accordance with 37 C.F.R. § 1.821(c) and (e), respectively, are the same;  
and

3. all statements made herein of their own knowledge are  
true and that all statements made on information and belief are believed to  
be true; and further, that these statements were made with the knowledge  
that willful false statements and the like so made are punishable by fine  
or imprisonment, or both, under Section 1001 of Title 18 of the United

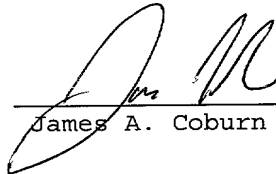
09833745 071501

Serial No. 09/833,745

States Code and that such willful false statements may jeopardize the validity of the application or any patent resulting therefrom.

Respectfully submitted,

July 5, 2001  
Date

  
James A. Coburn

**HARBOR CONSULTING**  
Intellectual Property Services  
1500A Lafayette Road  
Suite 262  
Portsmouth, N.H.  
800-318-3021

FOR "0" STAGE 00

## SEQUENCE LISTING

<110> ROBERTS, JOSEPH  
 SETHURAMAN, NATARAJAN  
 MACALLISTER, THOMAS

<120> CLONING, OVEREXPRESSION AND THERAPEUTIC USE OF  
 BIOACTIVE HISTIDINE AMMONIA LYASE

<130> 078728/0106

<140> 09/833,745

<141> 2001-04-13

<150> 60/197,770

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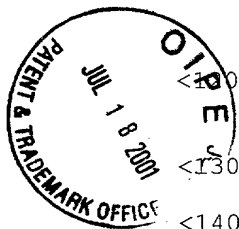
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09833745 0/1301

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Pro Gln Val Leu Glu Glu Leu Ala Ser Val Arg Ala His Ile Asp Ala  
35 40 45

Leu Ala Ser Ala Asp Thr Pro Val Tyr Gly Ile Ser Thr Gly Phe Gly  
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Ala Leu Ala Thr Arg His Ile Ala Pro Glu Asp Arg Ala Lys Leu Gln  
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Arg Ser Leu Ile Arg Ser His Ala Ala Gly Met Gly Glu Pro Val Glu  
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Arg Glu Val Val Arg Ala Leu Met Phe Leu Arg Ala Lys Thr Leu Ala  
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Ser Gly Arg Thr Gly Val Arg Pro Val Val Leu Glu Thr Met Val Gly  
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Met Leu Asn Ala Gly Ile Thr Pro Val Val Arg Glu Tyr Gly Ser Leu  
130 135 140

Gly Cys Ser Gly Asp Leu Ala Pro Leu Ser His Cys Ala Leu Val Leu  
145 150 155 160

Met Gly Glu Gly Glu Ala Thr Asp Ala His Gly Asp Ile Arg Pro Val  
165 170 175

Pro Glu Leu Phe Ala Glu Ala Gly Leu Thr Pro Val Glu Leu Ala Glu  
180 185 190

Lys Glu Gly Leu Ala Leu Val Asn Gly Thr Asp Gly Met Leu Gly Gln  
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Leu Ile Met Ala Leu Ala Asp Leu Asp Glu Leu Leu Asp Ile Ala Asp  
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0963745 071804

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Leu	Ala	Ser	Ala	Asp	Thr	Pro	Val	Tyr	Gly	Ile	Ser	Thr	Gly	Phe	Gly
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Gly	Cys	Ser	Gly	Asp	Leu	Ala	Pro	Leu	Ser	His	Cys	Ala	Leu	Val	Leu
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Met	Gly	Glu	Gly	Glu	Ala	Thr	Asp	Ala	His	Gly	Asp	Ile	Arg	Pro	Val
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          20          25          30

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 Leu Ala Ser Ala Asp Thr Pro Val Tyr Gly Ile Ser Thr Gly Phe Gly  
 50 55 60  
 Ala Leu Ala Thr Arg His Ile Ala Pro Glu Asp Arg Ala Lys Leu Gln  
 65 70 75 80  
 Arg Ser Leu Ile Arg Ser His Ala Ala Gly Met Gly Glu Pro Val Glu  
 85 90 95  
 Arg Glu Val Val Arg Ala Leu Met Phe Leu Arg Ala Lys Thr Leu Ala  
 100 105 110  
 Ser Gly Arg Thr Gly Val Arg Pro Val Val Leu Glu Thr Met Val Gly  
 115 120 125  
 Met Leu Asn Ala Gly Ile Thr Pro Val Val Arg Glu Tyr Gly Ser Leu  
 130 135 140  
 Gly Cys Ser Gly Asp Leu Ala Pro Leu Ser His Cys Ala Leu Val Leu  
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 Met Gly Glu Gly Glu Ala Thr Asp Ala His Gly Asp Ile Arg Pro Val  
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 Pro Glu Leu Phe Ala Glu Ala Gly Leu Thr Pro Val Glu Leu Ala Glu  
 180 185 190  
 Lys Glu Gly Leu Ala Leu Val Asn Gly Thr Asp Gly Met Leu Gly Gln  
 195 200 205  
 Leu Ile Met Ala Leu Ala Asp Leu Asp Glu Leu Leu Asp Ile Ala Asp  
 210 215 220  
 Ala Thr Ala Ala Met Ser Val Glu Ala Gln Leu Gly Thr Asp Gln Val  
 225 230 235 240  
 Phe Arg Ala Glu Leu His Glu Pro Leu Arg Pro His Pro Gly Gln Gly  
 245 250 255  
 Arg Ser Ala Gln Asn Met Phe Ala Phe Leu Ala Asp Ser Pro Ile Val  
 260 265 270  
 Ala Ser His Arg Glu Gly Asp Gly Arg Val Gln Asp Ala Tyr Ser Leu  
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 Arg Cys Ser Pro Gln Val Thr Gly Ala Ala Arg Asp Thr Ile Ala His  
 290 295 300  
 Ala Arg Leu Val Ala Thr Arg Glu Leu Ala Ala Ala Ile Asp Asn Pro  
 305 310 315 320  
 Val Val Leu Pro Ser Gly Glu Val Thr Ser Asn Gly Asn Phe His Gly  
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098334501304

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385 390 395 400

Asn Lys Arg Leu Ala Val Pro Ala Ser Val Asp Ser Ile Pro Ser Ser  
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Ala Met Gln Glu Asp His Val Ser Leu Gly Trp His Ala Ala Arg Lys  
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Leu Arg Thr Ser Val Ala Asn Leu Arg Arg Ile Leu Ala Val Glu Met  
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Leu Ile Ala Gly Arg Ala Leu Asp Leu Arg Ala Pro Leu Lys Pro Gly  
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Pro Ala Thr Gly Ala Val Leu Glu Val Leu Arg Ser Lys Val Ala Gly  
465 470 475 480

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Xaa	Xaa	Xaa	Xaa	Glu	Xaa	Leu	Ala	Xaa	Xaa	Arg	Xaa	Xaa	Xaa	Asp	Ala	35	40	45	
Leu	Ala	Xaa	Xaa	Xaa	Xaa	Pro	Val	Tyr	Gly	Xaa	Ser	Thr	Gly	Phe	Gly	50	55	60	
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Arg	Xaa	Xaa	Xaa	Arg	Ser	His	Ala	Ala	Gly	Met	Gly	Xaa	Xaa	Val	Glu	85	90	95	
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Ser	Gly	Xaa	Thr	Gly	Val	Arg	Pro	Xaa	Val	Xaa	Xaa	Thr	Met	Xaa	Gly	115	120	125	
Xaa	Leu	Asn	Ala	Gly	Ile	Thr	Pro	Val	Val	Xaa	Glu	Tyr	Gly	Ser	Leu	130	135	140	
Gly	Cys	Ser	Gly	Asp	Leu	Ala	Pro	Leu	Ser	His	Cys	Ala	Leu	Xaa	Leu	145	150	155	160
Met	Gly	Glu	Gly	Glu	Ala	Thr	Xaa	Xaa	Xaa	Gly	Xaa	Xaa	Arg	Pro	Xaa	165	170	175	
Xaa	Glu	Leu	Xaa	Ala	Xaa	Xaa	Gly	Xaa	Xaa	Pro	Val	Glu	Leu	Xaa	Glu	180	185	190	
Lys	Glu	Gly	Leu	Ala	Leu	Xaa	Asn	Gly	Thr	Asp	Gly	Met	Leu	Gly	Xaa	195	200	205	
Leu	Xaa	Met	Ala	Leu	Ala	Asp	Leu	Xaa	Xaa	Leu	Xaa	Xaa	Xaa	Ala	Asp	210	215	220	
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09933745.071804

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Asp Asp Val Ile Ala Val Ala Arg His Glu Ala Arg Ile Ser Ile Ser
      20              25              30

Pro Gln Val Leu Glu Glu Leu Ala Ser Val Arg Ala His Ile Asp Ala
      35              40              45

Leu Ala Ser Ala Asp Thr Pro Val Tyr Gly Ile Ser Thr Gly Phe Gly
      50              55              60

Ala Leu Ala Thr Arg His Ile Ala Pro Glu Asp Arg Ala Lys Leu Gln
      65              70              75              80

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F08720.542E550

Pro Gln Val Leu Glu Glu Leu Ala Ser Val Arg Ala His Ile Asp Ala  
35 40 45

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Arg	Ala	Glu	Leu	His	Glu	Pro	Leu	Arg	Pro	His	Pro	Gly	Gln	Gly	Arg
				245					250					255	
Ser	Ala	Gln	Asn	Met	Phe	Ala	Phe	Leu	Ala	Asp	Ser	Pro	Ile	Val	Ala
			260					265					270		
Ser	His	Arg	Glu	Gly	Asp	Gly	Arg	Val	Gln	Asp	Ala	Tyr	Ser	Leu	Arg
		275				280						285			
Cys	Ser	Pro	Gln	Val	Thr	Gly	Ala	Ala	Arg	Asp	Thr	Ile	Ala	His	Ala
290						295					300				
Arg	Leu	Val	Ala	Thr	Arg	Glu	Leu	Ala	Ala	Ala	Ile	Asp	Asn	Pro	Val
305					310					315					320
Val	Leu	Pro	Ser	Gly	Glu	Val	Thr	Ser	Asn	Gly	Asn	Phe	His	Gly	Ala
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Pro	Val	Ala	Tyr	Val	Leu	Asp	Phe	Leu	Ala	Ile	Ala	Val	Ala	Asp	Leu
			340					345					350		

Gly Ser Ile Ala Glu Arg Arg Thr Asp Arg Met Leu Asp Pro Ala Arg  
 355 360 365

Ser Arg Asp Leu Pro Ala Phe Leu Ala Asp Asp Pro Gly Val Asp Ser  
 370 375 380

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Lys Arg Leu Ala

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<220>

<223> Description of Artificial Sequence: Synthetic  
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Asp Asp Val Ile Ala Val Ala Arg His Glu Ala Arg Ile Ser Ile Ser  
 20 25 30

Pro Gln Val Leu Glu Glu Leu Ala Ser Val Arg Ala His Ile Asp Ala  
 35 40 45

Leu Ala Ser Ala Asp Thr Pro Val Tyr Gly Ile Ser Thr Gly Phe Gly  
 50 55 60

Ala Leu Ala Thr Arg His Ile Ala Pro Glu Asp Arg Ala Lys Leu Gln  
 65 70 75 80

Arg Ser Leu Ile Arg Ser His Ala Ala Gly Met Gly Glu Pro Val Glu  
 85 90 95

Arg Glu Val Val Arg Ala Leu Met Phe Leu Arg Ala Lys Thr Leu Ala  
 100 105 110

Ser Gly Arg Ser Val Arg Pro Val Val Leu Glu Thr Met Val Gly Met  
 115 120 125

Leu Asn Ala Gly Ile Thr Pro Val Val Arg Glu Tyr Gly Ser Leu Gly  
 130 135 140

Cys Ser Gly Asp Leu Ala Pro Leu Ser His Cys Ala Leu Val Leu Met  
 145 150 155 160

Gly Glu Gly Glu Ala Thr Asp Ala His Gly Asp Ile Arg Pro Val Pro  
 165 170 175

Glu Leu Phe Ala Glu Ala Gly Leu Thr Pro Val Glu Leu Ala Glu Lys  
 180 185 190

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Glu	Gly	Leu	Ala	Leu	Val	Asn	Gly	Thr	Asp	Gly	Met	Leu	Gly	Gln	Leu
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Ile	Met	Ala	Leu	Ala	Asp	Leu	Asp	Glu	Leu	Leu	Asp	Ile	Ala	Asp	Ala
	210					215					220				
Thr	Ala	Ala	Met	Ser	Val	Glu	Ala	Gln	Leu	Gly	Thr	Asp	Gln	Val	Phe
225					230					235					240
Arg	Ala	Glu	Leu	His	Glu	Pro	Leu	Arg	Pro	His	Pro	Gly	Gln	Gly	Arg
				245					250					255	
Ser	Ala	Gln	Asn	Met	Phe	Ala	Phe	Leu	Ala	Asp	Ser	Pro	Ile	Val	Ala
			260					265					270		
Ser	His	Arg	Glu	Gly	Asp	Gly	Arg	Val	Gln	Asp	Ala	Tyr	Ser	Leu	Arg
		275					280					285			
Cys	Ser	Pro	Gln	Val	Thr	Gly	Ala	Ala	Arg	Asp	Thr	Ile	Ala	His	Ala
	290					295					300				
Arg	Leu	Val	Ala	Thr	Arg	Glu	Leu	Ala	Ala	Ala	Ile	Asp	Asn	Pro	Val
305					310					315					320
Val	Leu	Pro	Ser	Gly	Glu	Val	Thr	Ser	Asn	Gly	Asn	Phe	His	Gly	Ala
				325					330					335	
Pro	Val	Ala	Tyr	Val	Leu	Asp	Phe	Leu	Ala	Ile	Ala	Val	Ala	Asp	Leu
			340					345					350		
Gly	Ser	Ile	Ala	Glu	Arg	Arg	Thr	Asp	Arg	Met	Leu	Asp	Pro	Ala	Arg
		355					360					365			
Ser	Arg	Asp	Leu	Pro	Ala	Phe	Leu	Ala	Asp	Asp	Pro	Gly	Val	Asp	Ser
	370					375					380				
Gly	Met	Met	Ile	Ala	Gln	Tyr	Thr	Gln	Ala	Gly	Leu	Val	Ala	Glu	Asn
385					390					395					400
Lys	Arg	Leu	Ala	Val	Pro	Ala	Val	Asp	Ser	Ile	Pro	Ser	Ser	Ala	Met
				405					410					415	
Gln	Glu	Asp	His	Val	Ser	Leu	Gly	Trp	His	Ala	Ala	Arg	Lys	Leu	Pro
			420					425					430		
Thr	Ser	Val	Ala	Asn	Leu	Arg	Arg	Ile	Leu	Ala	Val	Glu	Met	Leu	Ile
		435					440					445			
Ala	Gly	Arg	Ala	Leu	Asp	Leu	Arg	Ala	Pro	Leu	Lys	Pro	Gly	Pro	Ala
	450					455					460				
Thr	Gly	Ala	Val	Leu	Glu	Val	Leu	Arg	Ser	Lys	Val	Ala	Gly	Pro	Gly
465					470					475					480
Gln	Asp	Arg	Phe	Leu	Ser	Ala	Glu	Leu	Glu	Ala	Ala	Tyr	Asp	Leu	Leu
				485					490					495	

Ala Asn Gly Ser Val His Lys Ala Leu Glu Ala His Leu Pro Glu  
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 <212> PRT  
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		20						25					30		
Xaa	Xaa	Xaa	Xaa	Glu	Xaa	Leu	Ala	Xaa	Xaa	Arg	Xaa	Xaa	Xaa	Asp	Ala
		35					40					45			
Leu	Ala	Xaa	Xaa	Xaa	Xaa	Pro	Val	Tyr	Gly	Xaa	Ser	Thr	Gly	Phe	Gly
	50					55					60				
Ala	Leu	Ala	Xaa	Arg	His	Ile	Xaa	Xaa	Glu	Xaa	Arg	Ala	Xaa	Leu	Gln
	65				70					75					80
Arg	Xaa	Xaa	Xaa	Arg	Ser	His	Ala	Ala	Gly	Met	Gly	Xaa	Xaa	Val	Glu
				85					90					95	
Arg	Glu	Val	Val	Arg	Ala	Leu	Met	Phe	Leu	Arg	Xaa	Lys	Thr	Xaa	Ala
			100					105					110		
Ser	Gly	Xaa	Xaa	Val	Arg	Pro	Xaa	Val	Xaa	Xaa	Thr	Met	Xaa	Gly	Xaa
		115				120						125			
Leu	Asn	Ala	Gly	Ile	Thr	Pro	Val	Val	Xaa	Glu	Tyr	Gly	Ser	Leu	Gly
	130					135					140				
Cys	Ser	Gly	Asp	Leu	Ala	Pro	Leu	Ser	His	Cys	Ala	Leu	Val	Leu	Met
	145				150					155					160
Gly	Glu	Gly	Glu	Ala	Thr	Xaa	Xaa	Xaa	Gly	Xaa	Xaa	Arg	Pro	Xaa	Xaa
				165					170					175	
Glu	Leu	Xaa	Ala	Xaa	Xaa	Gly	Xaa	Xaa	Pro	Val	Glu	Leu	Xaa	Glu	Lys
			180					185					190		
Glu	Gly	Leu	Ala	Leu	Xaa	Asn	Gly	Thr	Asp	Gly	Met	Leu	Gly	Xaa	Leu
		195				200					205				
Xaa	Met	Ala	Leu	Ala	Asp	Leu	Xaa	Xaa	Leu	Xaa	Xaa	Xaa	Ala	Asp	Xaa
	210					215					220				
Thr	Ala	Ala	Xaa	Ser	Xaa	Glu	Ala	Xaa	Leu	Gly	Thr	Asp	Xaa	Val	Xaa
	225				230					235					240

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Xaa Xaa Glu Leu His Xaa Xaa Xaa Arg Pro His Pro Gly Gln Gly Xaa  
 245 250 255  
 Ser Ala Xaa Asn Met Xaa Xaa Xaa Leu Ala Xaa Ser Xaa Xaa Xaa Xaa  
 260 265 270  
 Xaa His Xaa Xaa Xaa Xaa Xaa Arg Val Gln Asp Ala Tyr Ser Xaa Arg  
 275 280 285  
 Cys Xaa Pro Gln Val Xaa Gly Ala Xaa Arg Asp Thr Xaa Xaa His Ala  
 290 295 300  
 Xaa Leu Val Ala Xaa Arg Glu Leu Ala Xaa Xaa Xaa Asp Asn Pro Val  
 305 310 315 320  
 Val Leu Pro Xaa Gly Xaa Val Xaa Ser Asn Gly Asn Phe His Gly Ala  
 325 330 335  
 Pro Val Ala Tyr Val Leu Asp Phe Leu Ala Ile Xaa Xaa Ala Asp Leu  
 340 345 350  
 Gly Ser Ile Xaa Glu Arg Arg Thr Asp Arg Xaa Leu Asp Xaa Xaa Arg  
 355 360 365  
 Ser Xaa Xaa Leu Pro Xaa Phe Leu Ala Asp Asp Xaa Gly Val Asp Ser  
 370 375 380  
 Gly Xaa Met Ile Ala Gln Tyr Thr Gln Ala Xaa Leu Val Xaa Glu Xaa  
 385 390 395 400  
 Lys Arg Leu Ala Val Pro Ala Xaa Asp Ser Ile Pro Ser Ser Ala Met  
 405 410 415  
 Gln Glu Asp His Val Ser Xaa Gly Trp Xaa Ala Ala Arg Lys Leu Xaa  
 420 425 430  
 Thr Xaa Val Xaa Asn Leu Xaa Arg Ile Xaa Ala Val Glu Xaa Xaa Xaa  
 435 440 445  
 Ala Xaa Arg Ala Xaa Xaa Leu Arg Ala Xaa Xaa Xaa Xaa Xaa Pro Ala  
 450 455 460  
 Xaa Xaa Ala Val Xaa Xaa Xaa Leu Arg Xaa Xaa Xaa Ala Gly Pro Gly  
 465 470 475 480  
 Gln Asp Arg Phe Leu Xaa Xaa Xaa Leu Xaa Ala Ala Xaa Xaa Xaa Xaa  
 485 490 495  
 Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Glu Xaa Xaa Xaa Xaa Xaa  
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&lt;211&gt; 1536

&lt;212&gt; DNA

&lt;213&gt; Artificial Sequence

&lt;220&gt;

<223> Description of Artificial Sequence: Synthetic expression  
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&lt;400&gt; 12

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gccgttgccc gccacgaagc ccgcatacagc atttctccgc aagtacttga ggaactggct 120
tccgtccgag cacatatcga tgcactagca tccgctgata ccccggttta tggcatttca 180
accggctttg gcgcgttggc aaccogccac atcgaccccg aggatcgcgc caagctgcag 240
cgctccctca tccgttccca cgctgctggc atgggtgaac cgggtggagcg cgaagtggtc 300
cgcgcatatga tgttcttgcg tgcaaagacc ctggcttccg gccgcagcgt tcgcccgggt 360
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&lt;210&gt; 13

&lt;211&gt; 30

&lt;212&gt; DNA

&lt;213&gt; Artificial Sequence

&lt;220&gt;

<223> Description of Artificial Sequence: Synthetic  
oligonucleotide

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cgcgttcagg acgcatactc cgttcgctgc

30

&lt;210&gt; 14

&lt;211&gt; 24

&lt;212&gt; DNA

&lt;213&gt; Artificial Sequence

&lt;220&gt;

<223> Description of Artificial Sequence: Synthetic  
oligonucleotide

&lt;400&gt; 14

gcccattggaa acgtggtctt cctg

24



&lt;220&gt;

<223> Description of Artificial Sequence: Synthetic  
oligonucleotide

&lt;400&gt; 19

accggagcag cccagtga

18

&lt;210&gt; 20

&lt;211&gt; 20

&lt;212&gt; DNA

&lt;213&gt; Artificial Sequence

&lt;220&gt;

<223> Description of Artificial Sequence: Synthetic  
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20

&lt;210&gt; 21

&lt;211&gt; 18

&lt;212&gt; DNA

&lt;213&gt; Artificial Sequence

&lt;220&gt;

<223> Description of Artificial Sequence: Synthetic  
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18

&lt;210&gt; 22

&lt;211&gt; 18

&lt;212&gt; DNA

&lt;213&gt; Artificial Sequence

&lt;220&gt;

<223> Description of Artificial Sequence: Synthetic  
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&lt;400&gt; 22

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&lt;210&gt; 23

&lt;211&gt; 27

&lt;212&gt; DNA

&lt;213&gt; Artificial Sequence

&lt;220&gt;

<223> Description of Artificial Sequence: Synthetic  
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&lt;400&gt; 23

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<210> 29  
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 <212> DNA  
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<220>  
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<210> 30  
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<400> 30  
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<210> 31  
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 <212> DNA  
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 <223> Description of Artificial Sequence: Synthetic  
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<400> 31  
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<210> 32  
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 <212> PRT  
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 <223> Description of Artificial Sequence: Synthetic  
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<210> 33

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<213> Artificial Sequence

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<223> Description of Artificial Sequence: Synthetic peptide

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<210> 34

<211> 509

<212> PRT

<213> Pseudomonas putida

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Pro Ala Ile Asp Ala Ser Val Ala Cys Val Glu Gln Ile Ile Ala Glu  
 35 40 45

Asp Arg Thr Ala Tyr Gly Ile Asn Thr Gly Phe Gly Leu Leu Ala Ser  
 50 55 60

Thr Arg Ile Ala Ser His Asp Leu Glu Asn Leu Gln Arg Ser Leu Val  
 65 70 75 80

Leu Ser His Ala Ala Gly Ile Gly Ala Pro Leu Asp Asp Asp Leu Val  
 85 90 95

Arg Leu Ile Met Val Leu Lys Ile Asn Ser Leu Ser Arg Gly Phe Ser  
 100 105 110

Gly Ile Arg Arg Lys Val Ile Asp Ala Leu Ile Ala Leu Val Asn Ala  
 115 120 125

Glu Val Tyr Pro His Ile Pro Leu Lys Gly Ser Val Gly Ala Ser Gly  
 130 135 140

Asp Leu Ala Pro Leu Ala Thr Met Ser Leu Val Leu Leu Gly Glu Gly  
 145 150 155 160

Lys Ala Arg Tyr Lys Gly Gln Trp Leu Ser Ala Thr Glu Ala Leu Ala  
 165 170 175

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Val Ala Gly Leu Glu Pro Leu Thr Leu Ala Ala Lys Glu Gly Leu Ala  
 180 185 190  
 Leu Leu Asn Gly Thr Gln Ala Ser Thr Ala Tyr Ala Leu Arg Gly Leu  
 195 200 205  
 Phe Tyr Ala Glu Asp Leu Tyr Ala Ala Ala Ile Ala Cys Gly Gly Leu  
 210 215 220  
 Ser Val Glu Ala Val Leu Gly Ser Arg Ser Pro Phe Asp Ala Arg Ile  
 225 230 235 240  
 His Glu Ala Arg Gly Gln Arg Gly Gln Ile Asp Thr Ala Ala Cys Phe  
 245 250 255  
 Arg Asp Leu Leu Gly Asp Ser Ser Glu Val Ser Leu Ser His Lys Asn  
 260 265 270  
 Cys Asp Lys Val Gln Asp Pro Tyr Ser Leu Arg Cys Gln Pro Gln Val  
 275 280 285  
 Met Gly Ala Cys Leu Thr Gln Leu Arg Gln Ala Ala Glu Val Leu Gly  
 290 295 300  
 Ile Glu Ala Asn Ala Val Ser Asp Asn Pro Leu Val Phe Ala Ala Glu  
 305 310 315 320  
 Gly Asp Val Ile Ser Gly Gly Asn Phe His Ala Glu Pro Val Ala Met  
 325 330 335  
 Ala Ala Asp Asn Leu Ala Leu Ala Ile Ala Glu Ile Gly Ser Leu Ser  
 340 345 350  
 Glu Arg Arg Ile Ser Leu Met Met Asp Lys His Met Ser Gln Leu Pro  
 355 360 365  
 Pro Phe Leu Val Glu Asn Gly Gly Val Asn Ser Gly Phe Met Ile Ala  
 370 375 380  
 Gln Val Thr Ala Ala Ala Leu Ala Ser Glu Asn Lys Ala Leu Ser His  
 385 390 395 400  
 Pro His Ser Val Asp Ser Leu Pro Thr Ser Ala Asn Gln Glu Asp His  
 405 410 415  
 Val Ser Met Ala Pro Ala Ala Gly Lys Arg Leu Trp Glu Met Ala Glu  
 420 425 430  
 Asn Thr Arg Gly Val Pro Ala Ile Glu Trp Leu Gly Ala Cys Gln Gly  
 435 440 445  
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 450 455 460  
 Arg Gln Ala Leu Arg Ser Glu Val Ala His Tyr Asp Arg Asp Arg Phe  
 465 470 475 480

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 102720.542E360



Phe Ala Pro Asp Ile Glu Lys Ala Val Glu Leu Leu Ala Lys Gly Ser  
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Leu Thr Gly Leu Leu Pro Ala Gly Val Leu Pro Ser Leu  
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<210> 35

<211> 511

<212> PRT

<213> Rhizobium meliloti

<400> 35

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 20 25 30

Ala Gly Ile Ala Lys Ala Ala Ala Arg Ile Ala Glu Ile Val Ala Gly  
 35 40 45

Asn Ala Pro Val Tyr Gly Ile Asn Thr Gly Phe Gly Lys Leu Ala Ser  
 50 55 60

Ile Lys Ile Asp Ser Ser Asp Val Ala Thr Leu Gln Arg Asn Leu Ile  
 65 70 75 80

Leu Ser His Cys Cys Gly Val Gly Gln Pro Leu Thr Glu Asp Ile Val  
 85 90 95

Arg Leu Ile Met Ala Leu Lys Leu Ile Ser Leu Gly Arg Gly Ala Ser  
 100 105 110

Gly Val Arg Leu Glu Leu Val Arg Leu Ile Glu Ala Met Leu Asp Lys  
 115 120 125

Gly Val Ile Pro Leu Ile Pro Glu Lys Gly Ser Val Gly Ala Ser Gly  
 130 135 140

Asp Leu Ala Pro Leu Ala His Met Ala Ala Val Met Met Gly His Gly  
 145 150 155 160

Glu Ala Phe Phe Ala Gly Glu Arg Met Lys Gly Asp Ala Ala Leu Lys  
 165 170 175

Ala Ala Gly Leu Ser Pro Val Thr Leu Ala Ala Lys Glu Gly Leu Ala  
 180 185 190

Leu Ile Asn Gly Thr Gln Val Ser Thr Ala Leu Ala Leu Ala Gly Leu  
 195 200 205

Phe Arg Ala His Arg Ala Gly Gln Ala Ala Leu Ile Thr Gly Ala Leu  
 210 215 220

Ser Thr Asp Ala Ala Met Gly Ser Ser Ala Pro Phe His Pro Asp Ile  
 225 230 235 240

009344-071001

Gln His Cys Ala Ala Ile Arg Ala Arg Ser Thr Arg Ala Ala Ala Leu  
 245 250 255  
 Arg Gln Leu Leu Thr Gly Ser Pro Ile Arg Gln Ser His Ile Glu Gly  
 260 265 270  
 Asp Glu Arg Val Gln Asp Pro Tyr Cys Ile Arg Cys Gln Pro Gln Val  
 275 280 285  
 Asp Gly Ala Cys Leu Asp Leu Leu Arg Ser Val Ala Ala Thr Leu Thr  
 290 295 300  
 Ile Glu Ala Asn Ala Val Thr Asp Asn Pro Leu Val Leu Ser Asp Asn  
 305 310 315 320  
 Ser Val Val Ser Gly Gly Asn Phe His Ala Glu Pro Val Ala Phe Ala  
 325 330 335  
 Ala Asp Gln Ile Ala Leu Ala Val Cys Glu Ile Gly Ala Ile Ser Gln  
 340 345 350  
 Arg Arg Ile Ala Leu Leu Val Asp Pro Ala Leu Ser Leu Arg Leu Pro  
 355 360 365  
 Ala Phe Leu Ala Lys Lys Pro Gly Leu Asn Ser Gly Leu Met Ile Ala  
 370 375 380  
 Glu Val Thr Ser Ala Ala Leu Met Ser Glu Asn Lys Gln Leu Ser His  
 385 390 395 400  
 Pro Ala Ser Val Asp Ser Thr Pro Thr Ser Ala Asn Gln Glu Asp His  
 405 410 415  
 Val Ser Met Ala Cys His Gly Ala Arg Arg Leu Leu Gln Met Thr Glu  
 420 425 430  
 Asn Leu Phe Ser Ile Ile Gly Ile Glu Ala Leu Ala Ala Val Gln Gly  
 435 440 445  
 Ile Glu Phe Arg Ala Pro Leu Thr Thr Ser Pro Glu Leu Gln Lys Ala  
 450 455 460  
 Ala Ala Ala Val Arg Gly Val Ser Ser Ser Ile Glu Glu Asp Arg Tyr  
 465 470 475 480  
 Met Ala Asp Asp Leu Lys Ala Ala Gly Asp Leu Val Ala Ser Gly Arg  
 485 490 495  
 Leu Ala Ala Ala Val Ser Ala Gly Ile Leu Pro Lys Leu Glu Asn  
 500 505 510

<210> 36  
 <211> 657  
 <212> PRT  
 <213> Mus sp.

09833745.071801

Met 1	Pro	Arg	Tyr	Thr 5	Val	His	Val	Arg	Gly 10	Glu	Trp	Leu	Ala	Val 15	Pro
Cys	Gln	Asp	Gly 20	Lys	Leu	Thr	Val	Gly 25	Trp	Leu	Gly	Arg	Glu 30	Ala	Val
Arg	Arg	Tyr 35	Met	Lys	Asn	Lys	Pro 40	Asp	Asn	Gly	Gly	Phe 45	Thr	Ser	Val
Asp	Glu 50	Val	Gln	Phe	Leu	Val 55	His	Arg	Cys	Lys	Gly 60	Leu	Gly	Leu	Leu
Asp 65	Asn	Glu	Asp	Glu	Leu 70	Glu	Val	Ala	Leu	Glu 75	Asp	Asn	Glu	Phe	Val 80
Glu	Val	Val	Ile 85	Glu	Gly	Asp	Val	Met	Ser 90	Pro	Asp	Phe	Ile	Pro 95	Ser
Gln	Pro	Glu	Gly 100	Val	Phe	Leu	Tyr	Ser 105	Lys	Tyr	Arg	Glu	Pro 110	Glu	Lys
Tyr	Ile 115	Ala	Leu	Asp	Gly	Asp	Ser 120	Leu	Ser	Thr	Glu	Asp 125	Leu	Val	Asn
Leu	Gly 130	Lys	Gly	Arg	Tyr	Lys 135	Ile	Lys	Leu	Thr	Ser 140	Ile	Ala	Glu	Lys
Lys 145	Val	Gln	Gln	Ser	Arg 150	Glu	Val	Ile	Asp	Ser 155	Ile	Ile	Lys	Glu	Arg 160
Thr	Val	Val	Tyr 165	Gly	Ile	Thr	Thr	Gly	Phe 170	Gly	Lys	Phe	Ala	Arg 175	Thr
Val	Ile	Pro	Ala 180	Asn	Lys	Leu	Gln	Glu 185	Leu	Gln	Val	Asn	Leu 190	Val	Arg
Ser	His 195	Ser	Ser	Gly	Val	Gly	Lys 200	Pro	Leu	Ser	Pro	Glu 205	Arg	Cys	Arg
Met 210	Leu	Leu	Ala	Leu	Arg	Ile 215	Asn	Val	Leu	Ala	Lys 220	Gly	Tyr	Ser	Gly
Ile 225	Ser	Leu	Glu	Thr	Leu 230	Lys	Gln	Val	Ile	Glu 235	Ala	Phe	Asn	Ala	Ser 240
Cys	Leu	Ser	Tyr 245	Val	Pro	Glu	Lys	Gly 250	Thr	Val	Gly	Ala	Ser 255	Gly	Asp
Leu	Ala	Pro	Leu 260	Ser	His	Leu	Ala	Leu 265	Gly	Leu	Ile	Gly	Glu 270	Gly	Lys
Met	Trp 275	Ser	Pro	Lys	Ser	Gly	Trp 280	Ala	Asp	Ala	Lys	Tyr 285	Val	Leu	Glu
Ala 290	His	Gly	Leu	Lys	Pro	Ile 295	Val	Leu	Lys	Pro	Lys 300	Glu	Gly	Leu	Ala

Leu	Ile	Asn	Gly	Thr	Gln	Met	Ile	Thr	Ser	Leu	Gly	Cys	Glu	Ala	Leu
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Glu	Arg	Ala	Ser	Ala	Ile	Ala	Arg	Gln	Ala	Asp	Ile	Val	Ala	Ala	Leu
				325					330					335	
Thr	Leu	Glu	Val	Leu	Lys	Gly	Thr	Thr	Lys	Ala	Phe	Asp	Thr	Asp	Ile
			340					345					350		
His	Ala	Val	Arg	Pro	His	Arg	Gly	Gln	Ile	Glu	Val	Ala	Phe	Arg	Phe
		355					360					365			
Arg	Ser	Leu	Leu	Asp	Ser	Asp	His	His	Pro	Ser	Glu	Ile	Ala	Glu	Ser
	370					375					380				
His	Arg	Phe	Cys	Asp	Arg	Val	Gln	Asp	Ala	Tyr	Thr	Leu	Arg	Cys	Cys
385					390					395					400
Pro	Gln	Val	His	Gly	Val	Val	Asn	Asp	Thr	Ile	Ala	Phe	Val	Lys	Asp
				405					410					415	
Ile	Ile	Thr	Thr	Glu	Leu	Asn	Ser	Ala	Thr	Asp	Asn	Pro	Met	Val	Phe
			420					425					430		
Ala	Ser	Arg	Gly	Glu	Thr	Ile	Ser	Gly	Gly	Asn	Phe	His	Gly	Glu	Tyr
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Pro	Ala	Lys	Ala	Leu	Asp	Tyr	Leu	Ala	Ile	Gly	Val	His	Glu	Leu	Ala
	450					455					460				
Ala	Ile	Ser	Glu	Arg	Arg	Ile	Glu	Arg	Leu	Cys	Asn	Pro	Ser	Leu	Ser
465					470					475					480
Glu	Leu	Pro	Ala	Phe	Leu	Val	Ala	Glu	Gly	Gly	Leu	Asn	Ser	Gly	Phe
				485					490					495	
Met	Ile	Ala	His	Cys	Thr	Ala	Ala	Ala	Leu	Val	Ser	Glu	Ser	Lys	Ala
			500					505					510		
Leu	Cys	His	Pro	Ser	Ser	Val	Asp	Ser	Leu	Ser	Thr	Ser	Ala	Ala	Thr
		515					520					525			
Glu	Asp	His	Val	Ser	Met	Gly	Gly	Trp	Ala	Ala	Arg	Lys	Ala	Leu	Arg
	530					535					540				
Val	Val	Glu	His	Val	Glu	Gln	Val	Leu	Ala	Ile	Glu	Leu	Leu	Ala	Ala
545					550					555					560
Cys	Gln	Gly	Ile	Glu	Phe	Leu	Arg	Pro	Leu	Lys	Thr	Thr	Thr	Pro	Leu
				565					570					575	
Glu	Lys	Val	Tyr	Asp	Leu	Val	Arg	Ser	Val	Val	Arg	Pro	Trp	Ile	Lys
			580					585					590		
Asp	Arg	Phe	Met	Ala	Pro	Asp	Ile	Glu	Ala	Ala	His	Arg	Leu	Leu	Leu
		595					600					605			

Asp Gln Lys Val Trp Glu Val Ala Ala Pro Tyr Ile Glu Lys Tyr Arg  
610 615 620

Met Glu His Ile Pro Glu Ser Arg Pro Leu Ser Pro Thr Ala Phe Ser  
625 630 635 640

Leu Glu Ser Leu Arg Lys Asn Ser Ala Thr Ile Pro Glu Ser Asp Asp  
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Leu

<210> 37

<211> 657

<212> PRT

<213> Rattus sp.

<400> 37

Met Pro Arg Tyr Thr Val His Val Arg Gly Glu Trp Leu Ala Val Pro  
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Cys Gln Asp Gly Lys Leu Ser Val Gly Trp Leu Gly Arg Glu Ala Val  
20 25 30

Arg Arg Tyr Met Lys Asn Lys Pro Asp Asn Gly Gly Phe Thr Ser Val  
35 40 45

Asp Glu Val Arg Phe Leu Val Arg Arg Cys Lys Gly Leu Gly Leu Leu  
50 55 60

Asp Asn Glu Asp Leu Leu Glu Val Ala Leu Glu Asp Asn Glu Phe Val  
65 70 75 80

Glu Val Val Ile Glu Gly Asp Val Met Ser Pro Asp Phe Ile Pro Ser  
85 90 95

Gln Pro Glu Gly Val Phe Leu Tyr Ser Lys Tyr Arg Glu Pro Glu Lys  
100 105 110

Tyr Ile Ala Leu Asp Gly Asp Ser Leu Ser Thr Glu Asp Leu Val Asn  
115 120 125

Leu Gly Lys Gly His Tyr Lys Ile Lys Leu Thr Ser Ile Ala Glu Lys  
130 135 140

Lys Val Gln Gln Ser Arg Glu Val Ile Asp Ser Ile Ile Lys Glu Arg  
145 150 155 160

Thr Val Val Tyr Gly Ile Thr Thr Gly Phe Gly Lys Phe Ala Arg Thr  
165 170 175

Val Ile Pro Ala Asn Lys Leu Gln Glu Leu Gln Val Asn Leu Val Arg  
180 185 190

Ser His Ser Ser Gly Val Gly Lys Pro Leu Ser Pro Glu Arg Cys Arg  
195 200 205

09374-01301

Met Leu Leu Ala Leu Arg Ile Asn Val Leu Ala Lys Gly Tyr Ser Gly  
 210 215 220  
 Ile Ser Leu Glu Thr Leu Lys Gln Val Ile Glu Val Phe Asn Ala Ser  
 225 230 235 240  
 Cys Leu Ser Tyr Val Pro Glu Lys Gly Thr Val Gly Ala Ser Gly Asp  
 245 250 255  
 Leu Ala Pro Leu Ser His Leu Ala Leu Gly Leu Ile Gly Glu Gly Lys  
 260 265 270  
 Met Trp Ser Pro Lys Ser Gly Trp Ala Asp Ala Lys Tyr Val Leu Glu  
 275 280 285  
 Ala His Gly Leu Lys Pro Ile Val Leu Lys Pro Lys Glu Gly Leu Ala  
 290 295 300  
 Leu Ile Asn Gly Thr Gln Met Ile Thr Ser Leu Gly Cys Glu Ala Val  
 305 310 315 320  
 Glu Arg Ala Ser Ala Ile Ala Arg Gln Ala Asp Ile Val Ala Ala Leu  
 325 330 335  
 Thr Leu Glu Val Leu Lys Gly Thr Thr Lys Ala Phe Asp Thr Asp Ile  
 340 345 350  
 His Ala Val Arg Pro His Arg Gly Gln Ile Glu Val Ala Phe Arg Phe  
 355 360 365  
 Arg Ser Leu Leu Asp Ser Asp His His Pro Ser Glu Ile Ala Glu Ser  
 370 375 380  
 His Arg Phe Cys Asp Arg Val Gln Asp Ala Tyr Thr Leu Arg Cys Cys  
 385 390 395 400  
 Pro Gln Val His Gly Val Val Asn Asp Thr Ile Ala Phe Val Lys Asp  
 405 410 415  
 Ile Ile Thr Thr Glu Leu Asn Ser Ala Thr Asp Asn Pro Met Val Phe  
 420 425 430  
 Ala Ser Arg Gly Glu Thr Ile Ser Gly Gly Asn Phe His Gly Glu Tyr  
 435 440 445  
 Pro Ala Lys Ala Leu Asp Tyr Leu Ala Ile Gly Val His Glu Leu Ala  
 450 455 460  
 Ala Ile Ser Glu Arg Arg Ile Glu Arg Leu Cys Asn Pro Ser Leu Ser  
 465 470 475 480  
 Glu Leu Pro Ala Phe Leu Val Ala Glu Gly Gly Leu Asn Ser Gly Phe  
 485 490 495  
 Met Ile Ala His Cys Thr Ala Ala Ala Leu Val Ser Glu Ser Lys Ala  
 500 505 510

0033745 071804  
FOBT 20 5425350

Leu Cys His Pro Ser Ser Val Asp Ser Leu Ser Thr Ser Ala Ala Thr  
515 520 525

Glu Asp His Val Ser Met Gly Gly Trp Ala Ala Arg Lys Ala Leu Arg  
530 535 540

Val Ile Glu His Val Glu Gln Val Leu Ala Ile Glu Leu Leu Ala Ala  
545 550 555 560

Cys Gln Gly Ile Glu Phe Leu Arg Pro Leu Lys Thr Thr Thr Pro Leu  
565 570 575

Glu Lys Val Tyr Asp Leu Val Arg Ser Val Val Arg Pro Trp Ile Lys  
580 585 590

Asp Arg Phe Met Ala Pro Asp Ile Glu Ala Ala His Arg Leu Leu Leu  
595 600 605

Asp Gln Lys Val Trp Glu Val Ala Ala Pro Tyr Ile Glu Lys Tyr Arg  
610 615 620

Met Glu His Ile Pro Glu Ser Arg Pro Leu Ser Pro Thr Ala Phe Ser  
625 630 635 640

Leu Glu Ser Leu Arg Lys Asn Ser Ala Thr Ile Pro Glu Ser Asp Asp  
645 650 655

Leu

<210> 38

<211> 635

<212> PRT

<213> Homo sapiens

<400> 38

Met Pro Arg Tyr Thr Val His Val Arg Gly Glu Trp Leu Ala Val Pro  
1 5 10 15

Cys Gln Asp Ala Gln Leu Thr Val Gly Trp Leu Gly Arg Glu Ala Val  
20 25 30

Arg Arg Tyr Ile Lys Asn Lys Pro Asp Asn Gly Gly Phe Thr Ser Val  
35 40 45

Asp Asp Ala His Phe Leu Val Arg Arg Cys Lys Gly Leu Gly Leu Leu  
50 55 60

Asp Asn Glu Asp Arg Leu Glu Val Ala Leu Glu Asn Asn Glu Phe Val  
65 70 75 80

Glu Val Val Ile Glu Gly Asp Ala Met Ser Pro Asp Phe Ile Pro Ser  
85 90 95

Gln Pro Glu Gly Val Tyr Leu Tyr Ser Lys Tyr Arg Glu Pro Glu Lys  
100 105 110

0983745-071E01

Tyr	Ile	Glu	Leu	Asp	Gly	Asp	Arg	Leu	Thr	Thr	Glu	Asp	Leu	Val	Asn	
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Leu	Gly	Lys	Gly	Arg	Tyr	Lys	Ile	Lys	Leu	Thr	Pro	Thr	Ala	Glu	Lys	
		130					135					140				
Arg	Val	Gln	Lys	Ser	Arg	Glu	Val	Ile	Asp	Ser	Ile	Ile	Lys	Glu	Lys	
145				150					155					160		
Thr	Val	Val	Tyr	Gly	Ile	Thr	Thr	Gly	Phe	Gly	Lys	Phe	Ala	Arg	Thr	
		165					170					175				
Val	Ile	Pro	Ile	Asn	Lys	Leu	Gln	Glu	Leu	Gln	Val	Asn	Leu	Val	Arg	
		180					185					190				
Ser	His	Ser	Ser	Gly	Val	Gly	Lys	Pro	Leu	Ser	Pro	Glu	Arg	Cys	Arg	
		195					200					205				
Met	Leu	Leu	Ala	Leu	Arg	Ile	Asn	Val	Leu	Ala	Lys	Gly	Tyr	Ser	Gly	
210				215					220					225		
Ile	Ser	Leu	Glu	Thr	Leu	Lys	Gln	Val	Ile	Glu	Met	Phe	Asn	Ala	Ser	
225				230					235					240		
Cys	Leu	Pro	Tyr	Val	Pro	Glu	Lys	Gly	Thr	Val	Gly	Ala	Ser	Gly	Asp	
		245					250					255				
Leu	Ala	Pro	Leu	Ser	His	Leu	Ala	Leu	Gly	Leu	Val	Gly	Glu	Gly	Lys	
		260					265					270				
Met	Trp	Ser	Pro	Lys	Ser	Gly	Trp	Ala	Asp	Ala	Lys	Tyr	Val	Leu	Glu	
		275					280					285				
Ala	His	Gly	Leu	Lys	Pro	Val	Ile	Leu	Lys	Pro	Lys	Glu	Gly	Leu	Ala	
290				295					300					305		
Leu	Ile	Asn	Gly	Thr	Gln	Met	Ile	Thr	Ser	Leu	Gly	Cys	Glu	Ala	Val	
305				310					315					320		
Glu	Arg	Ala	Ser	Ala	Ile	Ala	Arg	Gln	Ala	Asp	Ile	Val	Ala	Ala	Leu	
		325					330					335				
Thr	Leu	Glu	Val	Leu	Lys	Gly	Thr	Thr	Lys	Ala	Phe	Asp	Thr	Asp	Ile	
		340					345					350				
His	Ala	Leu	Arg	Pro	His	Arg	Gly	Gln	Ile	Glu	Val	Ala	Phe	Arg	Phe	
		355					360					365				
Arg	Ser	Leu	Leu	Asp	Ser	Leu	Arg	Cys	Cys	Pro	Gln	Val	His	Gly	Val	
370				375					380					385		
Val	Asn	Asp	Thr	Ile	Ala	Phe	Val	Lys	Asn	Ile	Ile	Thr	Thr	Glu	Leu	
385				390					395					400		
Asn	Ser	Ala	Thr	Asp	Asn	Pro	Met	Val	Phe	Ala	Asn	Arg	Gly	Glu	Thr	
		405					410					415				



Val Ser Gly Gly Asn Phe His Gly Glu Tyr Pro Ala Lys Ala Leu Asp  
420 425 430

Tyr Leu Ala Ile Gly Ile His Glu Leu Ala Ala Ile Ser Glu Arg Arg  
435 440 445

Ile Glu Arg Leu Cys Asn Pro Ser Leu Ser Glu Leu Pro Ala Phe Leu  
450 455 460

Val Ala Glu Gly Gly Leu Asn Ser Gly Phe Met Ile Ala His Cys Thr  
465 470 475 480

Ala Ala Ala Leu Val Ser Glu Asn Lys Ala Leu Cys His Pro Ser Ser  
485 490 495

Val Asp Ser Leu Ser Thr Ser Ala Ala Thr Glu Asp His Val Ser Met  
500 505 510

Gly Gly Trp Ala Ala Arg Lys Ala Leu Arg Val Ile Glu His Val Glu  
515 520 525

Gln Val Leu Ala Ile Glu Leu Leu Ala Ala Cys Gln Gly Ile Glu Phe  
530 535 540

Leu Arg Pro Leu Lys Thr Thr Thr Pro Leu Glu Lys Val Tyr Asp Leu  
545 550 555 560

Val Arg Ser Val Val Arg Pro Trp Ile Lys Asp Arg Phe Met Ala Pro  
565 570 575

Asp Ile Glu Ala Ala His Arg Leu Leu Leu Glu Gln Lys Val Trp Glu  
580 585 590

Val Ala Ala Pro Tyr Ile Glu Lys Tyr Arg Met Glu His Ile Pro Glu  
595 600 605

Ser Arg Pro Leu Ser Pro Thr Ala Phe Ser Leu Gln Phe Leu His Lys  
610 615 620

Lys Ser Thr Lys Ile Pro Glu Ser Glu Asp Leu  
625 630 635

<210> 39

<211> 677

<212> PRT

<213> Caenorhabditis elegans

<400> 39

Met Arg Leu Gln Val Gln Ile Gly Thr Glu Cys Val Val Val Pro Cys  
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Lys Pro Asp Asp Thr Ile His Ala Val Ala Lys Lys Ser Val Glu Lys  
20 25 30

Leu Arg Arg Leu Arg Pro Lys Leu Pro Leu Ala Asp Asp Tyr Phe Glu  
35 40 45

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Val	Arg	Arg	Thr	Val	Gly	Asn	Ser	Leu	Leu	Asp	Pro	Glu	Asp	Leu	Val
50						55				60					
Ser	Asp	Val	Leu	Lys	Asp	Ser	Asp	Phe	Ile	Ile	Val	Ala	Ala	Ser	Val
65					70					75					80
Glu	Glu	Thr	Glu	Asp	Ala	Lys	Glu	Ala	Lys	Lys	Gln	Glu	Glu	Ile	Asp
				85					90					95	
Asn	Ala	Arg	Ala	Glu	Ile	Glu	Lys	Ile	Asp	Asn	Arg	Arg	Arg	Lys	Val
			100					105					110		
Ser	Phe	Ala	Asp	Ser	Leu	Ala	Pro	Met	Val	Leu	Ala	Pro	Pro	Thr	Lys
		115					120					125			
Leu	Leu	Ile	Leu	Asp	Gly	Asn	Ser	Leu	Leu	Pro	Glu	Asp	Leu	Val	Arg
	130					135					140				
Cys	Glu	Lys	Gly	Glu	Cys	Ala	Ile	Gln	Leu	Ser	Met	Glu	Ser	Glu	Asp
145					150					155					160
Arg	Ile	Arg	Lys	Ala	Arg	Thr	Phe	Leu	Glu	Lys	Ile	Ala	Ser	Glu	His
				165					170					175	
Arg	Ala	Val	Tyr	Gly	Val	Thr	Thr	Gly	Phe	Gly	Thr	Phe	Ser	Asn	Val
			180					185					190		
Thr	Ile	Pro	Pro	Glu	Lys	Leu	Lys	Lys	Leu	Gln	Leu	Asn	Leu	Ile	Arg
		195					200					205			
Ser	His	Ala	Thr	Gly	Tyr	Gly	Glu	Pro	Leu	Ala	Pro	Asn	Arg	Ala	Arg
	210					215					220				
Met	Leu	Leu	Ala	Leu	Arg	Ile	Asn	Ile	Leu	Ala	Lys	Gly	His	Ser	Gly
225					230					235					240
Ile	Ser	Val	Glu	Asn	Ile	Lys	Lys	Met	Ile	Ala	Ala	Phe	Asn	Ala	Phe
				245					250					255	
Cys	Val	Ser	Tyr	Val	Pro	Gln	Gln	Gly	Thr	Val	Gly	Cys	Ser	Gly	Asp
			260					265					270		
Leu	Cys	Pro	Leu	Ala	His	Leu	Ala	Leu	Gly	Leu	Leu	Gly	Glu	Gly	Lys
		275					280					285			
Met	Trp	Ser	Pro	Thr	Thr	Gly	Trp	Gln	Pro	Ala	Asp	Val	Val	Leu	Lys
	290					295					300				
Lys	Asn	Asn	Leu	Glu	Pro	Leu	Glu	Leu	Gly	Pro	Lys	Glu	Gly	Leu	Ala
305					310					315					320
Leu	Ile	Asn	Gly	Thr	Gln	Met	Val	Thr	Ala	Leu	Gly	Ala	Tyr	Thr	Leu
				325					330					335	
Glu	Arg	Ala	His	Asn	Ile	Ala	Arg	Gln	Ala	Asp	Val	Ile	Ala	Ala	Leu
			340					345					350		

Ser	Leu	Asp	Val	Leu	Lys	Gly	Thr	Thr	Arg	Ala	Tyr	Asp	Pro	Asp	Ile
355						360						365			
His	Arg	Ile	Arg	Pro	His	Arg	Gly	Gln	Asn	Leu	Ser	Ala	Leu	Arg	Leu
370						375				380					
Arg	Ala	Leu	Leu	His	Ser	Glu	Ala	Asn	Pro	Ser	Gln	Ile	Ala	Glu	Ser
385				390						395				400	
His	Arg	Asn	Cys	Thr	Lys	Val	Gln	Asp	Ala	Tyr	Thr	Leu	Arg	Cys	Val
				405				410						415	
Pro	Gln	Val	His	Gly	Val	Val	His	Asp	Thr	Ile	Glu	Phe	Val	Arg	Glu
		420						425				430			
Ile	Ile	Thr	Thr	Glu	Met	Asn	Ser	Ala	Thr	Asp	Asn	Pro	Leu	Val	Phe
		435				440						445			
Ala	Asp	Arg	Glu	Glu	Ile	Ile	Ser	Gly	Gly	Asn	Phe	His	Gly	Glu	Tyr
450						455				460					
Pro	Ala	Lys	Ala	Leu	Asp	Phe	Leu	Ala	Ile	Ala	Val	Ala	Glu	Leu	Ala
465				470						475				480	
Gln	Met	Ser	Glu	Arg	Arg	Leu	Glu	Arg	Leu	Val	Asn	Lys	Glu	Leu	Ser
				485				490						495	
Gly	Leu	Pro	Thr	Glu	Leu	Thr	Pro	Asp	Gly	Gly	Leu	Asn	Ser	Gly	Phe
		500						505				510			
Met	Thr	Val	Gln	Leu	Cys	Ala	Ala	Ser	Leu	Val	Ser	Glu	Asn	Lys	Val
515						520						525			
Leu	Cys	His	Pro	Ser	Ser	Val	Asp	Ser	Ile	Pro	Thr	Ser	Cys	Asn	Gln
530						535				540					
Glu	Asp	His	Val	Ser	Met	Gly	Gly	Phe	Ala	Ala	Arg	Lys	Ala	Leu	Thr
545				550						555				560	
Val	Val	Glu	His	Val	Glu	Ala	Val	Leu	Ala	Met	Glu	Leu	Leu	Ala	Ala
				565				570						575	
Cys	Gln	Gly	Ile	Glu	Phe	Leu	Lys	Pro	Leu	Ile	Ser	Thr	Ala	Pro	Leu
		580						585				590			
His	Lys	Ile	Tyr	Gln	Leu	Val	Arg	Ser	Val	Ala	Pro	Pro	Leu	Asn	Glu
595						600						605			
Asp	Arg	Tyr	Met	Lys	Pro	Glu	Ile	Asp	Ala	Val	Leu	Glu	Met	Ile	Arg
610						615				620					
Glu	Asn	Arg	Ile	Trp	Glu	Ala	Val	Leu	Pro	His	Leu	Glu	Thr	Leu	Glu
625				630						635				640	
Ala	Met	Glu	Glu	Leu	Asp	Pro	Asp	Ala	Leu	Arg	Gln	Phe	Thr	Lys	Thr
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Glu Glu Ser Ile Glu  
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<210> 40

<211> 508

<212> PRT

<213> Bacillus subtilis

<400> 40

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Val Leu Phe Asp Phe Glu Glu Ala Ala Val Ser Glu Glu Ser Met Glu  
                   20                  25                  30

Arg Val Lys Lys Ser Arg Ala Ala Val Glu Arg Ile Val Arg Asp Glu  
                   35                  40                  45

Lys Thr Ile Tyr Gly Ile Asn Thr Gly Phe Gly Lys Phe Ser Asp Val  
                   50                  55                  60

Leu Ile Gln Lys Glu Asp Ser Ala Ala Leu Gln Leu Asn Leu Ile Leu  
   65                  70                  75                  80

Ser His Ala Cys Gly Val Gly Asp Pro Phe Pro Glu Cys Val Ser Arg  
                   85                  90                  95

Ala Met Leu Leu Leu Arg Ala Asn Ala Leu Leu Lys Gly Phe Ser Gly  
                   100                  105                  110

Val Arg Ala Glu Leu Ile Glu Gln Leu Leu Ala Phe Leu Asn Lys Arg  
                   115                  120                  125

Val His Pro Val Ile Pro Gln Gln Gly Ser Leu Gly Ala Ser Gly Asp  
                   130                  135                  140

Leu Ala Pro Leu Ser His Leu Ala Leu Ala Leu Ile Gly Gln Gly Glu  
   145                  150                  155                  160

Val Phe Phe Glu Gly Glu Arg Met Pro Ala Met Thr Gly Leu Lys Lys  
                   165                  170                  175

Ala Gly Ile Gln Pro Val Thr Leu Thr Ser Lys Glu Gly Leu Ala Leu  
                   180                  185                  190

Ile Asn Gly Thr Gln Ala Met Thr Ala Met Gly Val Val Ala Tyr Ile  
                   195                  200                  205

Glu Ala Glu Lys Leu Ala Tyr Gln Thr Glu Arg Ile Ala Ser Leu Thr  
                   210                  215                  220

Ile Glu Gly Leu Gln Gly Ile Ile Asp Ala Phe Asp Glu Asp Ile His  
   225                  230                  235                  240

0983745.071804

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<210> 41
<211> 516
<212> PRT
<213> Streptomyces griseus
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Met	Asp	Met	His	Thr	Val	Val	Val	Gly	Thr	Ser	Gly	Thr	Thr	Ala	Glu
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Asp	Val	Val	Ala	Val	Ala	Arg	His	Gly	Ala	Arg	Val	Glu	Leu	Ser	Ala
			20					25					30		
Ala	Ala	Val	Glu	Ala	Leu	Ala	Ala	Ala	Arg	Leu	Ile	Val	Asp	Ala	Leu
			35					40				45			
Ala	Ala	Lys	Pro	Glu	Pro	Val	Tyr	Gly	Val	Ser	Thr	Gly	Phe	Gly	Ala
		50				55					60				
Leu	Ala	Ser	Arg	His	Ile	Gly	Thr	Glu	Leu	Arg	Ala	Gln	Leu	Gln	Arg
65					70					75					80
Asn	Ile	Val	Arg	Ser	His	Ala	Ala	Gly	Met	Gly	Pro	Arg	Val	Glu	Arg
				85					90					95	
Glu	Val	Val	Arg	Ala	Leu	Met	Phe	Leu	Arg	Leu	Lys	Thr	Val	Ala	Ser
			100					105					110		
Gly	His	Thr	Gly	Val	Arg	Pro	Glu	Val	Ala	Gln	Thr	Met	Ala	Asp	Val
			115				120					125			
Leu	Asn	Ala	Gly	Ile	Thr	Pro	Val	Val	His	Glu	Tyr	Gly	Ser	Leu	Gly
			130			135					140				
Cys	Ser	Gly	Asp	Leu	Ala	Pro	Leu	Ser	His	Cys	Ala	Leu	Thr	Leu	Met
145					150					155					160
Gly	Glu	Gly	Glu	Ala	Glu	Gly	Pro	Asp	Gly	Thr	Val	Arg	Pro	Ala	Gly
				165					170					175	
Glu	Leu	Leu	Ala	Ala	His	Gly	Ile	Ala	Pro	Val	Glu	Leu	Arg	Glu	Lys
			180					185					190		
Glu	Gly	Leu	Ala	Leu	Leu	Asn	Gly	Thr	Asp	Gly	Met	Leu	Gly	Met	Leu
		195					200					205			
Val	Met	Ala	Leu	Ala	Asp	Leu	Arg	Asn	Leu	Tyr	Thr	Ser	Ala	Asp	Ile
		210				215					220				
Thr	Ala	Ala	Leu	Ser	Leu	Glu	Ala	Leu	Leu	Gly	Thr	Asp	Lys	Val	Leu
225					230					235					240
Ala	Pro	Glu	Leu	His	Ala	Ile	Arg	Pro	His	Pro	Gly	Gln	Gly	Val	Ser
				245					250					255	
Ala	Asp	Asn	Met	Ser	Arg	Val	Leu	Ala	Gly	Ser	Gly	Leu	Thr	Gly	His
			260					265					270		
His	Gln	Asp	Asp	Ala	Pro	Arg	Val	Gln	Asp	Ala	Tyr	Ser	Val	Arg	Cys
		275					280					285			
Ala	Pro	Gln	Val	Asn	Gly	Ala	Gly	Arg	Asp	Thr	Leu	Asp	His	Ala	Ala
		290				295					300				

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 103120 542E850

<400> 42  
Met Ala Ser Ala Pro Gln Ile Thr Leu Gly Leu Ser Gly Ala Thr Ala  
1 5 10 15  
Asp Asp Val Ile Ala Val Ala Arg His Glu Ala Arg Ile Ser Ile Ser  
20 25 30  
Pro Gln Val Leu Glu Glu Leu Ala Ser Val Arg Ala His Ile Asp Ala  
35 40 45

Leu	Ala	Ser	Ala	Asp	Thr	Pro	Val	Tyr	Gly	Ile	Ser	Thr	Gly	Phe	Gly
50						55					60				
Ala	Leu	Ala	Thr	Arg	His	Ile	Ala	Pro	Glu	Asp	Arg	Ala	Lys	Leu	Gln
65					70					75					80
Arg	Ser	Leu	Ile	Arg	Ser	His	Ala	Ala	Gly	Met	Gly	Glu	Pro	Val	Glu
				85					90					95	
Arg	Glu	Val	Val	Arg	Ala	Leu	Met	Phe	Leu	Arg	Ala	Lys	Thr	Leu	Ala
			100					105					110		
Ser	Gly	Arg	Ser	Val	Arg	Pro	Val	Val	Leu	Glu	Thr	Met	Val	Gly	Met
		115				120						125			
Leu	Asn	Ala	Gly	Ile	Thr	Pro	Val	Val	Arg	Glu	Tyr	Gly	Ser	Leu	Gly
130						135					140				
Cys	Ser	Gly	Asp	Leu	Ala	Pro	Leu	Ser	His	Cys	Ala	Leu	Val	Leu	Met
145					150					155					160
Gly	Glu	Gly	Glu	Ala	Thr	Asp	Ala	His	Gly	Asp	Ile	Arg	Pro	Val	Pro
				165					170					175	
Glu	Leu	Phe	Ala	Glu	Ala	Gly	Leu	Thr	Pro	Val	Glu	Leu	Ala	Glu	Lys
			180					185					190		
Glu	Gly	Leu	Ala	Leu	Val	Asn	Gly	Thr	Asp	Gly	Met	Leu	Gly	Gln	Leu
		195					200					205			
Ile	Met	Ala	Leu	Ala	Asp	Leu	Asp	Glu	Leu	Leu	Asp	Ile	Ala	Asp	Ala
	210					215					220				
Thr	Ala	Ala	Met	Ser	Val	Glu	Ala	Gln	Leu	Gly	Thr	Asp	Gln	Val	Phe
225					230					235					240
Arg	Ala	Glu	Leu	His	Glu	Pro	Leu	Arg	Pro	His	Pro	Gly	Gln	Gly	Arg
				245					250					255	
Ser	Ala	Gln	Asn	Met	Phe	Ala	Phe	Leu	Ala	Asp	Ser	Pro	Ile	Val	Ala
			260					265					270		
Ser	His	Arg	Glu	Gly	Asp	Gly	Arg	Val	Gln	Asp	Ala	Tyr	Ser	Leu	Arg
		275					280					285			
Cys	Ser	Pro	Gln	Val	Thr	Gly	Ala	Ala	Arg	Asp	Thr	Ile	Ala	His	Ala
290						295					300				
Arg	Leu	Val	Ala	Thr	Arg	Glu	Leu	Ala	Ala	Ala	Ile	Asp	Asn	Pro	Val
305					310					315					320
Val	Leu	Pro	Ser	Gly	Glu	Val	Thr	Ser	Asn	Gly	Asn	Phe	His	Gly	Ala
				325					330					335	
Pro	Val	Ala	Tyr	Val	Leu	Asp	Phe	Leu	Ala	Ile	Ala	Val	Ala	Asp	Leu
			340					345					350		



Gly Ser Ile Ala Glu Arg Arg Thr Asp Arg Met Leu Asp Pro Ala Arg  
355 360 365

Ser Arg Asp Leu Pro Ala Phe Leu Ala Asp Asp Pro Gly Val Asp Ser  
370 375 380

Gly Met Met Ile Ala Gln Tyr Thr Gln Ala Gly Leu Val Ala Glu Asn  
385 390 395 400

Lys Arg Leu Ala Val Pro Ala Val Asp Ser Ile Pro Ser Ser Ala Met  
405 410 415

Gln Glu Asp His Val Ser Leu Gly Trp His Ala Ala Arg Lys Leu Pro  
420 425 430

Thr Ser Val Ala Asn Leu Arg Arg Ile Leu Ala Val Glu Met Leu Ile  
435 440 445

Ala Gly Arg Ala Leu Asp Leu Arg Ala Pro Leu Lys Pro Gly Pro Ala  
450 455 460

Thr Gly Ala Val Leu Glu Val Leu Arg Ser Lys Val Ala Gly Pro Gly  
465 470 475 480

Gln Asp Arg Phe Leu Ser Ala Glu Leu Glu Ala Ala Tyr Asp Leu Leu  
485 490 495

Ala Asn Gly Ser Val His Lys Ala Leu Glu Ala His Leu Pro Glu  
500 505 510

<210> 43

<211> 513

<212> PRT

<213> Unknown Organism

<220>

<223> Description of Unknown Organism: 983831/HAL

<400> 43

Met Ala Ser Ala Pro Gln Ile Thr Leu Gly Leu Ser Gly Ala Thr Ala  
1 5 10 15

Asp Asp Val Ile Ala Val Ala Arg His Glu Ala Arg Ile Ser Ile Ser  
20 25 30

Pro Gln Val Leu Glu Glu Leu Ala Ser Val Arg Ala His Ile Asp Ala  
35 40 45

Leu Ala Ser Ala Asp Thr Pro Val Tyr Gly Ile Ser Thr Gly Phe Gly  
50 55 60

Ala Leu Ala Thr Arg His Ile Ala Pro Glu Asp Arg Ala Lys Leu Gln  
65 70 75 80

Arg Ser Leu Ile Arg Ser His Ala Ala Gly Met Gly Glu Pro Val Glu  
85 90 95

093345-01001

Arg Glu Val Val Arg Ala Leu Met Phe Leu Arg Ala Lys Thr Leu Ala  
 100 105 110  
 Ser Gly Arg Thr Gly Val Arg Pro Val Val Leu Glu Thr Met Val Gly  
 115 120 125  
 Met Leu Asn Ala Gly Ile Thr Pro Val Val Arg Glu Tyr Gly Ser Leu  
 130 135 140  
 Gly Cys Ser Gly Asp Leu Ala Pro Leu Ser His Cys Ala Leu Val Leu  
 145 150 155 160  
 Met Gly Glu Gly Glu Ala Thr Asp Ala His Gly Asp Ile Arg Pro Val  
 165 170 175  
 Pro Glu Leu Phe Ala Glu Ala Gly Leu Thr Pro Val Glu Leu Ala Glu  
 180 185 190  
 Lys Glu Gly Leu Ala Leu Val Asn Gly Thr Asp Gly Met Leu Gly Gln  
 195 200 205  
 Leu Ile Met Ala Leu Ala Asp Leu Asp Glu Leu Leu Asp Ile Ala Asp  
 210 215 220  
 Ala Thr Ala Ala Met Ser Val Glu Ala Gln Leu Gly Thr Asp Gln Val  
 225 230 235 240  
 Phe Arg Ala Glu Leu His Glu Pro Leu Arg Pro His Pro Gly Gln Gly  
 245 250 255  
 Arg Ser Ala Gln Asn Met Phe Ala Phe Leu Ala Asp Ser Pro Ile Val  
 260 265 270  
 Ala Ser His Arg Glu Gly Asp Gly Arg Val Gln Asp Ala Tyr Ser Leu  
 275 280 285  
 Arg Cys Ser Pro Gln Val Thr Gly Ala Ala Arg Asp Thr Ile Ala His  
 290 295 300  
 Ala Arg Leu Val Ala Thr Arg Glu Leu Ala Ala Ala Ile Asp Asn Pro  
 305 310 315 320  
 Val Val Leu Pro Ser Gly Glu Val Thr Ser Asn Gly Asn Phe His Gly  
 325 330 335  
 Ala Pro Val Ala Tyr Val Leu Asp Phe Leu Ala Ile Ala Val Ala Asp  
 340 345 350  
 Leu Gly Ser Ile Ala Glu Arg Arg Thr Asp Arg Met Leu Asp Pro Ala  
 355 360 365  
 Arg Ser Arg Asp Leu Pro Ala Phe Leu Ala Asp Asp Pro Gly Val Asp  
 370 375 380  
 Ser Gly Met Met Ile Ala Gln Tyr Thr Gln Ala Gly Leu Val Ala Glu  
 385 390 395 400

0503345  
 1001  
 542E350

Asn Lys Arg Leu Ala Val Pro Ala Ser Val Asp Ser Ile Pro Ser Ser  
405 410 415

Ala Met Gln Glu Asp His Val Ser Leu Gly Trp His Ala Ala Arg Lys  
420 425 430

Leu Arg Thr Ser Val Ala Asn Leu Arg Arg Ile Leu Ala Val Glu Met  
435 440 445

Leu Ile Ala Gly Arg Ala Leu Asp Leu Arg Ala Pro Leu Lys Pro Gly  
450 455 460

Pro Ala Thr Gly Ala Val Leu Glu Val Leu Arg Ser Lys Val Ala Gly  
465 470 475 480

Pro Gly Gln Asp Arg Phe Leu Ser Ala Glu Leu Glu Ala Ala Tyr Asp  
485 490 495

Leu Leu Ala Asn Gly Ser Val His Lys Ala Leu Glu Ala His Leu Pro  
500 505 510

Ala

<210> 44

<211> 513

<212> PRT

<213> Streptomyces coelicolor

<400> 44

Met Ala Ser Met His Thr Val Val Val Gly Thr Ser Gly Val Thr Ala  
1 5 10 15

Ser Asp Val Leu Ala Val Ala Arg Ala Gly Ala Arg Ile Glu Leu Ser  
20 25 30

Glu Glu Ala Val Ala Ala Leu Ala Ala Arg Ser Val Val Asp Ala  
35 40 45

Leu Ala Ala Lys Pro Asp Pro Val Tyr Gly Val Ser Thr Gly Phe Gly  
50 55 60

Ala Leu Ala Thr Arg His Ile Ser Pro Glu Leu Arg Gly Arg Leu Gln  
65 70 75 80

Arg Asn Ile Val Arg Ser His Ala Ala Gly Met Gly Pro Arg Val Glu  
85 90 95

Arg Glu Val Val Arg Ala Leu Met Phe Leu Arg Leu Lys Thr Val Cys  
100 105 110

Ser Gly Arg Thr Gly Val Arg Pro Glu Val Ala Gln Thr Met Ala Asp  
115 120 125

Val Leu Asn Ala Gly Ile Thr Pro Val Val His Glu Tyr Gly Ser Leu  
130 135 140

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Gly 145	Cys	Ser	Gly	Asp 150	Leu	Ala	Pro	Leu	Ser	His 155	Cys	Ala	Leu	Thr	Leu 160
Met	Gly	Glu	Gly	Asp 165	Ala	Glu	Gly	Pro	Asp 170	Gly	Thr	Val	Arg	Pro 175	Ala
Gly	Glu	Leu	Leu	Ala 180	Ala	His	Gly	Ile 185	Ala	Pro	Val	Glu	Leu	Arg 190	Glu
Lys	Glu	Gly 195	Leu	Ala	Leu	Leu	Asn 200	Gly	Thr	Asp	Gly	Met 205	Leu	Gly	Met
Leu	Val 210	Met	Ala	Leu	Ala	Asp 215	Leu	Asp	Thr	Leu	Tyr 220	Lys	Ser	Ala	Asp
Ile 225	Thr	Ala	Ala	Leu	Thr 230	Met	Glu	Ala	Leu	Leu 235	Gly	Thr	Asp	Arg	Val 240
Leu	Ala	Pro	Glu	Leu 245	His	Ala	Pro	Ile	Arg 250	Pro	His	Pro	Gly	Gln 255	Ala
Ala	Ser	Ala	Ala	Asn 260	Met	Ala	Ala	Val 265	Leu	Lys	Gly	Ser	Gly	Leu 270	Thr
Gly	His	His 275	Gln	Asp	Asp	Ala	Pro 280	Arg	Val	Gln	Asp	Ala 285	Tyr	Ser	Val
Arg	Cys 290	Ala	Pro	Gln	Val	Ala 295	Gly	Ala	Gly	Arg	Asp 300	Thr	Met	Ala	His
Ala 305	Gly	Leu	Val	Ala	Glu	Arg 310	Glu	Leu	Ala	Ala 315	Ala	Val	Asp	Asn	Pro 320
Val	Val	Leu	Pro	Asp 325	Gly	Arg	Val	Glu	Ser 330	Asn	Gly	Asn	Phe	His 335	Gly
Ala	Pro	Val	Ala 340	Tyr	Val	Leu	Asp	Phe 345	Leu	Ala	Val	Ala 350	Val	Ala	Asp
Leu	Gly	Ser 355	Ile	Ala	Glu	Arg	Arg 360	Thr	Asp	Arg	Leu	Leu 365	Asp	Lys	Asn
Arg	Ser 370	His	Gly	Leu	Pro	Pro 375	Phe	Leu	Ala	Asp	Asp 380	Ala	Gly	Val	Asp
Ser 385	Gly	Leu	Met	Ile	Ala 390	Gln	Tyr	Thr	Gln	Ala 395	Ala	Leu	Val	Gly	Glu 400
Leu	Lys	Arg	Leu	Ala 405	Val	Pro	Ala	Ser	Ala 410	Asp	Ser	Ile	Pro	Ser 415	Ser
Ala	Met	Gln	Glu	Asp 420	His	Val	Ser	Met	Gly 425	Trp	Ser	Ala	Ala 430	Arg	Lys
Leu	Arg	Thr 435	Ala	Val	Asp	Asn	Leu 440	Ala	Arg	Val	Ile	Ala 445	Val	Glu	Leu

Tyr Ala Ala Thr Arg Ala Ile Gln Leu Arg Glu Gly Leu Thr Pro Ala  
450 455 460

Pro Ala Ser Gln Ala Val Val Glu Ala Val Arg Ala Ala Val Glu Gly  
465 470 475 480

Pro Gly Pro Asp Arg His Leu Ala Pro Asp Leu Ala Ala Ala Asp Ala  
485 490 495

Phe Val Arg Ala Gly His Leu Val Ala Ala Ala Glu Ser Val Thr Gly  
500 505 510

Pro

<210> 45

<211> 513

<212> PRT

<213> Streptomyces griseus

<400> 45

Met Met Asp Met His Thr Val Val Val Gly Thr Ser Gly Thr Thr Ala  
1 5 10 15

Glu Asp Val Val Ala Val Ala Arg His Gly Ala Arg Val Glu Leu Ser  
20 25 30

Ala Ala Ala Val Glu Ala Leu Ala Ala Arg Leu Ile Val Asp Ala  
35 40 45

Leu Ala Ala Lys Pro Glu Pro Val Tyr Gly Val Ser Thr Gly Phe Gly  
50 55 60

Ala Leu Ala Ser Arg His Ile Gly Thr Glu Leu Arg Ala Gln Leu Gln  
65 70 75 80

Arg Asn Ile Val Arg Ser His Ala Ala Gly Met Gly Pro Arg Val Glu  
85 90 95

Arg Glu Val Val Arg Ala Leu Met Phe Leu Arg Leu Lys Thr Val Ala  
100 105 110

Ser Gly His Thr Gly Val Arg Pro Glu Val Ala Gln Thr Met Ala Asp  
115 120 125

Val Leu Asn Ala Gly Ile Thr Pro Val Val His Glu Tyr Gly Ser Leu  
130 135 140

Gly Cys Ser Gly Asp Leu Ala Pro Leu Ser His Cys Ala Leu Thr Leu  
145 150 155 160

Met Gly Glu Gly Glu Ala Glu Gly Pro Asp Gly Thr Val Arg Pro Ala  
165 170 175

Gly Glu Leu Leu Ala Ala His Gly Ile Ala Pro Val Glu Leu Arg Glu  
180 185 190

09033745 071004

Lys	Glu	Gly	Leu	Ala	Leu	Leu	Asn	Gly	Thr	Asp	Gly	Met	Leu	Gly	Met	
		195					200					205				
Leu	Val	Met	Ala	Leu	Ala	Asp	Leu	Arg	Asn	Leu	Tyr	Thr	Ser	Ala	Asp	
	210					215					220					
Ile	Thr	Ala	Ala	Leu	Ser	Leu	Glu	Ala	Leu	Leu	Gly	Thr	Asp	Lys	Val	
225					230					235					240	
Leu	Ala	Pro	Glu	Leu	His	Ala	Pro	Ile	Arg	Pro	His	Pro	Gly	Gln	Gly	
				245					250					255		
Val	Ser	Ala	Asp	Asn	Met	Ser	Arg	Val	Leu	Ala	Gly	Ser	Gly	Leu	Thr	
			260					265					270			
Gly	His	His	Gln	Asp	Asp	Ala	Pro	Arg	Val	Gln	Asp	Ala	Tyr	Ser	Val	
		275					280					285				
Arg	Cys	Ala	Pro	Gln	Val	Asn	Gly	Ala	Gly	Arg	Asp	Thr	Leu	Asp	His	
	290					295					300					
Ala	Ala	Leu	Val	Ala	Gly	Arg	Glu	Leu	Ala	Ser	Ser	Val	Asp	Asn	Pro	
305					310					315					320	
Val	Val	Leu	Pro	Asp	Gly	Arg	Val	Glu	Ser	Asn	Gly	Asn	Phe	His	Gly	
				325					330					335		
Ala	Pro	Val	Ala	Tyr	Val	Leu	Asp	Phe	Leu	Ala	Ile	Val	Ala	Ala	Asp	
			340					345					350			
Leu	Gly	Ser	Ile	Cys	Glu	Arg	Arg	Thr	Asp	Arg	Leu	Leu	Asp	Lys	Asn	
		355					360					365				
Arg	Ser	His	Gly	Leu	Pro	Pro	Phe	Leu	Ala	Asp	Asp	Ala	Gly	Val	Asp	
	370					375					380					
Ser	Gly	Leu	Met	Ile	Ala	Gln	Tyr	Thr	Gln	Ala	Ala	Leu	Val	Ser	Glu	
385					390					395					400	
Met	Lys	Arg	Leu	Ala	Val	Pro	Ala	Ser	Ala	Asp	Ser	Ile	Pro	Ser	Ser	
				405					410					415		
Ala	Met	Gln	Glu	Asp	His	Val	Ser	Met	Gly	Trp	Ser	Ala	Ala	Arg	Lys	
			420					425					430			
Leu	Arg	Thr	Ala	Val	Asp	Asn	Leu	Ala	Arg	Ile	Val	Ala	Val	Glu	Leu	
		435					440					445				
Tyr	Ala	Ala	Thr	Arg	Ala	Ile	Glu	Leu	Arg	Ala	Ala	Leu	Thr	Pro	Ala	
	450					455					460					
Pro	Ala	Ser	Glu	Ala	Val	Val	Ala	Ala	Leu	Arg	Ala	Ala	Gly	Ala	Gly	
465					470					475					480	
Pro	Gly	Pro	Asp	Arg	Phe	Leu	Ala	Pro	Asp	Leu	Ala	Ala	Ala	Asp	Thr	
				485					490					495		

Phe Val Arg Glu Gly Arg Leu Val Ala Ala Val Glu Pro Val Thr Gly  
 500 505 510

Pro

<210> 46  
 <211> 513  
 <212> PRT  
 <213> Deinococcus radiodurans

<400> 46  
 Met Ala Ser Ala Pro Gln Ile Met Ile Leu Asp Arg Asp Leu Asn Leu  
 1 5 10 15  
 Glu Gln Phe Ile Ser Val Val Arg His Gly Glu Gln Val Glu Leu Ser  
 20 25 30  
 Ala Ala Ala Arg Glu Arg Ile Ala Arg Ala Arg Thr Val Ile Glu Gln  
 35 40 45  
 Ile Val Glu Gly Asp Thr Pro Ile Tyr Gly Val Asn Thr Gly Phe Gly  
 50 55 60  
 Lys Phe Glu Asn Val Gln Ile Asp Arg Ser Gln Leu Ala Gln Leu Gln  
 65 70 75 80  
 His Asn Leu Ile Val Ser His Ala Ile Gly Met Gly Glu Pro Leu Pro  
 85 90 95  
 Ala Glu Val Val Arg Gly Met Leu Leu Leu Arg Ala Gln Ser Leu Ser  
 100 105 110  
 Leu Gly His Ser Gly Val Arg Val Glu Val Val Glu Leu Leu Leu Ala  
 115 120 125  
 Leu Leu Asn Ala Asp Ala Leu Pro Val Val Pro Ser Gln Gly Ser Val  
 130 135 140  
 Gly Ala Ser Gly Asp Leu Ala Pro Leu Ala His Leu Ala Leu Gly Leu  
 145 150 155 160  
 Ile Gly Leu Gly Asp Ile Thr Glu Tyr Gln Gly Gln Val Arg Pro Ala  
 165 170 175  
 Ala Asp Val Leu Ala Glu Leu Gly Leu Ser Pro Val Gln Leu Gln Ala  
 180 185 190  
 Lys Glu Gly Leu Ala Leu Ile Asn Gly Thr Gln Leu Met Gly Ser Leu  
 195 200 205  
 Leu Ala Leu Ala Leu His Asp Ala Gln Val Leu Leu Gly Thr Ala Asn  
 210 215 220  
 Leu Ala Ala Ala Met Thr Val Glu Ala Arg Tyr Gly Ser His Arg Pro  
 225 230 235 240

09833745 "071904  
 T08T20"542E860

Phe Gln Pro Asp Val His Val Gly Leu Arg Pro His Pro Gly Ala Leu  
 245 250 255  
 Ala Val Ala Ala Glu Leu Arg Glu Phe Leu Ala Gly Ser Glu Ile Ala  
 260 265 270  
 Pro Ser His Leu Thr Gly Asp Gly Lys Val Gln Asp Ala Tyr Ser Leu  
 275 280 285  
 Arg Ala Val Pro Gln Val His Gly Ala Thr Trp Asp Ala Leu Ala Gln  
 290 295 300  
 Ala Glu Arg Val Leu Ala Val Glu Phe Ala Ser Val Thr Asp Asn Pro  
 305 310 315 320  
 Leu Ile Phe Pro Thr Gly Glu Val Val Ser Gly Gly Asn Phe His Gly  
 325 330 335  
 Gln Pro Leu Ala Val Thr Ile Asp Ala Leu Lys Val Ala Val Ala Glu  
 340 345 350  
 Leu Gly Ser Ile Ser Glu Arg Arg Thr Glu Gln Leu Leu Asn Pro Ala  
 355 360 365  
 Leu Ser Arg Gly Leu Pro Ala Phe Leu Thr Pro Asn Gly Gly Leu Asn  
 370 375 380  
 Ser Gly Phe Met Ile Ala Gln Tyr Thr Ser Ala Ala Leu Val Ser Glu  
 385 390 395 400  
 Asn Lys Val Leu Ser His Pro Ala Ser Val Asp Ser Ile Pro Thr Ser  
 405 410 415  
 Ala Asn Gln Glu Asp His Val Ser Met Gly Ala His Ala Ala Arg Gln  
 420 425 430  
 Leu Arg Gln Ile Val Ala Asn Val Gln Thr Val Leu Ser Ile Glu Leu  
 435 440 445  
 Leu Cys Ala Ala Gln Gly Leu Asp Phe Gln Gln Pro Leu Arg Ala Gly  
 450 455 460  
 Arg Gly Val Gln Ala Ala Tyr Glu Tyr Val Arg Thr Phe Val Pro Thr  
 465 470 475 480  
 Leu Thr Glu Asp Arg Tyr Phe Arg Pro Asp Leu Leu Arg Leu Arg Gly  
 485 490 495  
 Glu Leu Val Ser Gly Arg Val Ala Gln Ala Ala Asp Thr Gln Ala Pro  
 500 505 510

Ala

<210> 47  
 <211> 513  
 <212> PRT

096370747E960  
 10370747E960



<213> Agrobacterium rhizogenes

<400> 47

Met	Ala	Ser	Ala	Pro	Gln	Ile	Thr	Leu	Gly	Leu	Ser	Gly	Val	Pro	Leu	1	5	10	15
His	His	Leu	Ala	Asp	Ile	Tyr	Trp	Asn	Asn	Gly	Ser	Ala	Lys	Leu	Asp	20	25	30	
Pro	Ser	Phe	Asp	Ala	Ala	Val	Leu	Lys	Gly	Ala	Ala	Arg	Ile	Ala	Glu	35	40	45	
Ile	Ala	Ala	Gly	Asn	Ala	Pro	Val	Tyr	Gly	Ile	Asn	Thr	Gly	Phe	Gly	50	55	60	
Lys	Leu	Ala	Ser	Ile	Lys	Ile	Asp	Ala	Ala	Asp	Leu	Ala	Thr	Leu	Gln	65	70	75	80
Arg	Asn	Leu	Ile	Leu	Ser	His	Cys	Cys	Gly	Val	Gly	Ala	Pro	Leu	Pro	85	90	95	
Glu	Asn	Val	Val	Arg	Leu	Ile	Met	Ala	Leu	Lys	Leu	Ile	Ser	Leu	Gly	100	105	110	
Arg	Gly	Ala	Ser	Gly	Val	Arg	Ile	Glu	Leu	Ile	Arg	Leu	Ile	Glu	Gly	115	120	125	
Met	Leu	Glu	Lys	Gly	Val	Ile	Pro	Val	Ile	Pro	Glu	Lys	Gly	Ser	Val	130	135	140	
Gly	Ala	Ser	Gly	Asp	Leu	Ala	Pro	Leu	Ala	His	Met	Ser	Ala	Thr	Met	145	150	155	160
Met	Gly	Glu	Gly	Glu	Ala	Phe	Asp	Tyr	Gln	Gly	Val	Gln	Met	Pro	Ser	165	170	175	
Lys	Asp	Ala	Leu	Ala	Lys	Ala	Gly	Leu	Ser	Pro	Val	Val	Leu	Ala	Ala	180	185	190	
Lys	Glu	Gly	Leu	Ala	Leu	Ile	Asn	Gly	Thr	Gln	Thr	Ser	Thr	Ala	Leu	195	200	205	
Ala	Leu	Ala	Gly	Leu	Phe	Arg	Ala	His	Arg	Ala	Ala	Gln	Ser	Ala	Leu	210	215	220	
Val	Thr	Gly	Ala	Leu	Ser	Thr	Asp	Ala	Ala	Met	Gly	Ser	Ser	Ala	Pro	225	230	235	240
Phe	His	Pro	Asp	Ile	His	Thr	Pro	Leu	Arg	Gly	His	Lys	Gly	Gln	Ile	245	250	255	
Asp	Ala	Gly	Ser	Ala	Leu	Arg	Asn	Leu	Leu	Gln	Gly	Ser	Glu	Ile	Arg	260	265	270	
Glu	Ser	His	Ile	Glu	Gly	Asp	Glu	Arg	Val	Gln	Asp	Pro	Tyr	Cys	Ile	275	280	285	

0963745-071304

<400> 48  
Met Ala Ser Ala Pro Gln Ile Thr Leu Gly Leu Ser Gly Val Pro Leu  
1 5 10 15  
His His Leu Ala Asp Ile Tyr Trp Asn Asn Gly Ser Ala Lys Leu Asp  
20 25 30

Pro Ser Phe Asp Ala Ala Val Leu Lys Gly Ala Ala Arg Ile Ala Glu  
           35                          40                          45  
 Ile Ala Ala Gly Asn Ala Pro Val Tyr Gly Ile Asn Thr Gly Phe Gly  
       50                          55                          60  
 Lys Leu Ala Ser Ile Lys Ile Asp Ala Ala Asp Leu Ala Thr Leu Gln  
       65                          70                          75                          80  
 Arg Asn Leu Ile Leu Ser His Cys Cys Gly Val Gly Ala Pro Leu Pro  
                           85                          90                          95  
 Glu Asn Val Val Arg Leu Ile Met Ala Leu Lys Leu Ile Ser Leu Gly  
                           100                          105                          110  
 Arg Gly Ala Ser Gly Val Arg Ile Glu Leu Ile Arg Leu Ile Glu Gly  
           115                          120                          125  
 Met Leu Glu Lys Gly Val Ile Pro Val Ile Pro Glu Lys Gly Ser Val  
       130                          135                          140  
 Gly Ala Ser Gly Asp Leu Ala Pro Leu Ala His Met Ser Ala Thr Met  
       145                          150                          155                          160  
 Met Gly Glu Gly Glu Ala Phe Asp Tyr Gln Gly Val Gln Met Pro Ser  
                           165                          170                          175  
 Lys Asp Ala Leu Ala Lys Ala Gly Leu Ser Pro Val Val Leu Ala Ala  
                           180                          185                          190  
 Lys Glu Gly Leu Ala Leu Ile Asn Gly Thr Gln Thr Ser Thr Ala Leu  
           195                          200                          205  
 Ala Leu Ala Gly Leu Phe Arg Ala His Arg Ala Ala Gln Ser Ala Leu  
       210                          215                          220  
 Val Thr Gly Ala Leu Ser Thr Asp Ala Ala Met Gly Ser Ser Ala Pro  
       225                          230                          235                          240  
 Phe His Pro Asp Ile His Thr Pro Leu Arg Gly His Lys Gly Gln Ile  
                           245                          250                          255  
 Asp Ala Gly Ser Ala Leu Arg Asn Leu Leu Gln Gly Ser Glu Ile Arg  
           260                          265                          270  
 Glu Ser His Ile Glu Gly Asp Glu Arg Val Gln Asp Pro Tyr Cys Ile  
           275                          280                          285  
 Arg Cys Gln Pro Gln Val Asp Gly Ala Cys Leu Asp Leu Leu Ala Ser  
       290                          295                          300  
 Val Ala Arg Thr Leu Glu Ile Glu Ala Asn Ala Val Thr Asp Asn Pro  
       305                          310                          315                          320  
 Leu Val Leu Ser Asp Asn Ser Val Val Ser Gly Gly Asn Phe His Ala  
                           325                          330                          335

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Glu Pro Val Ala Phe Ala Ala Asp Gln Thr Ala Leu Ala Val Cys Glu  
 340 345 350  
 Ile Gly Ala Ile Ala Gln Arg Arg Ile Ala Leu Leu Val Asp Pro Ala  
 355 360 365  
 Leu Ser Tyr Gly Leu Pro Ala Phe Leu Ser Lys Lys Pro Gly Leu Asn  
 370 375 380  
 Ser Gly Leu Met Ile Ala Glu Val Thr Ser Ala Ala Leu Met Ser Glu  
 385 390 395 400  
 Asn Lys Gln Met Ser His Pro Ala Ser Val Asp Ser Thr Pro Thr Ser  
 405 410 415  
 Ala Asn Gln Glu Asp His Val Ser Met Ala Cys His Gly Ala Arg Arg  
 420 425 430  
 Leu Leu Ala Met Thr Asp Asn Leu Phe Gly Ile Leu Gly Ile Glu Ala  
 435 440 445  
 Leu Ala Ala Val Gln Gly Val Glu Leu Arg Gly Pro Leu Lys Thr Ser  
 450 455 460  
 Pro Glu Leu Glu Lys Ala Ala Ala Val Leu Arg Ser Ala Val Pro Val  
 465 470 475 480  
 Leu Glu Asp Asp Arg Tyr Met Ala Thr Asp Leu Lys Ala Ala Ile Glu  
 485 490 495  
 Val Val Ala Ser Gly Ala Leu Val Ser Ala Ile Ser Ser Gly Leu Pro  
 500 505 510  
 Val

<210> 49  
 <211> 513  
 <212> PRT  
 <213> Bacillus subtilis

<400> 49  
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 Ala Asp Val Ala Arg Val Leu Phe Asp Phe Glu Glu Ala Ala Ala Ser  
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 Glu Glu Ser Met Glu Arg Val Lys Lys Ser Arg Ala Ala Val Glu Arg  
 35 40 45  
 Ile Val Arg Asp Glu Lys Thr Ile Tyr Gly Ile Asn Thr Gly Phe Gly  
 50 55 60  
 Lys Phe Ser Asp Val Leu Ile Gln Lys Glu Asp Ser Ala Ala Leu Gln  
 65 70 75 80

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Leu Asn Leu Ile Leu Ser His Ala Cys Gly Val Gly Asp Pro Phe Pro  
                     85                    90                    95  
 Glu Cys Val Ser Arg Ala Met Leu Leu Leu Arg Ala Asn Ala Leu Leu  
                     100                    105                    110  
 Lys Gly Phe Ser Gly Val Arg Ala Glu Leu Ile Glu Gln Leu Leu Ala  
                     115                    120                    125  
 Phe Leu Asn Lys Arg Val His Pro Val Ile Pro Gln Gln Gly Ser Leu  
                     130                    135                    140  
 Gly Ala Ser Gly Asp Leu Ala Pro Leu Ser His Leu Ala Leu Ala Leu  
                     145                    150                    155                    160  
 Ile Gly Gln Gly Glu Val Phe Asp Phe Glu Gly Glu Arg Met Pro Ala  
                     165                    170                    175  
 Met Thr Gly Leu Lys Lys Ala Gly Ile Gln Pro Val Thr Leu Thr Ser  
                     180                    185                    190  
 Lys Glu Gly Leu Ala Leu Ile Asn Gly Thr Gln Ala Met Thr Ala Met  
                     195                    200                    205  
 Gly Val Val Ala Tyr Ile Glu Ala Glu Lys Leu Ala Tyr Gln Thr Glu  
                     210                    215                    220  
 Arg Ile Ala Ser Leu Thr Ile Glu Gly Leu Gln Gly Ile Ile Asp Ala  
                     225                    230                    235                    240  
 Phe Asp Glu Asp Ile His Leu Ala Leu Arg Gly Tyr Gln Glu Gln Ile  
                     245                    250                    255  
 Asp Val Ala Glu Arg Ile Arg Phe Tyr Leu Ser Asp Ser Gly Leu Thr  
                     260                    265                    270  
 Thr Ser His Arg Gln Gly Glu Leu Arg Val Gln Asp Ala Tyr Ser Leu  
                     275                    280                    285  
 Arg Cys Ile Pro Gln Val His Gly Ala Thr Trp Gln Thr Leu Gly Tyr  
                     290                    295                    300  
 Val Lys Glu Lys Leu Glu Ile Glu Met Asn Ala Ala Thr Asp Asn Pro  
                     305                    310                    315                    320  
 Leu Ile Phe Asn Asp Gly Asp Val Ile Ser Gly Gly Asn Phe His Gly  
                     325                    330                    335  
 Gln Pro Ile Ala Phe Ala Met Asp Phe Leu Lys Ile Ala Ile Ser Glu  
                     340                    345                    350  
 Leu Ala Asn Ile Ala Glu Arg Arg Ile Glu Arg Leu Val Asn Pro Gln  
                     355                    360                    365  
 Leu Asn Arg Asp Leu Pro Pro Phe Leu Ser Pro His Pro Gly Leu Gln  
                     370                    375                    380

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Ser Gly Ala Met Ile Met Gln Tyr Ala Ala Ala Ser Leu Val Ser Glu  
385 390 395 400

Asn Lys Thr Leu Ala His Pro Ala Ser Val Asp Ser Ile Pro Ser Ser  
405 410 415

Ala Asn Gln Glu Asp His Val Ser Met Gly Thr Ile Ala Ala Arg His  
420 425 430

Ala Tyr Gln Val Ile Ala Asn Thr Arg Arg Val Ile Ala Ile Glu Ala  
435 440 445

Ile Cys Ala Leu Gln Ala Val Glu Tyr Arg Gly Ile Glu His Ala Ala  
450 455 460

Ser Tyr Thr Lys Gln Leu Phe Gln Glu Met Arg Lys Val Val Pro Ser  
465 470 475 480

Ile Gln Gln Asp Arg Val Phe Ser Tyr Asp Ile Glu Arg Leu Thr Asp  
485 490 495

Trp Leu Lys Lys Glu Ser Leu Ile Pro Asp His Gln Asn Lys Glu Leu  
500 505 510

Arg

<210> 50

<211> 513

<212> PRT

<213> Vibrio cholerae

<400> 50

Met Ala Ser Met Leu His Leu Met Ile Lys Pro Gly Gln Leu Ser Leu  
1 5 10 15

Lys Gln Leu Arg Gln Val Ser Arg Ser Pro Val Val Leu Ser Leu Asp  
20 25 30

Pro Glu Ala Ile Pro Ala Ile Ala Glu Ser Ala Gln Val Val Glu Gln  
35 40 45

Val Ile Ser Glu Gly Arg Thr Val Tyr Gly Ile Asn Thr Gly Phe Gly  
50 55 60

Leu Leu Ala Asn Thr Lys Ile Ala Pro Gln Asp Leu Glu Thr Leu Gln  
65 70 75 80

Lys Ser Ile Val Leu Ser His Ala Ala Gly Ile Gly Glu Leu Met Ser  
85 90 95

Asp Glu Thr Val Arg Leu Met Met Leu Leu Lys Ile Asn Ser Leu Ala  
100 105 110

Arg Gly Tyr Ser Gly Ile Arg Leu Glu Val Ile Gln Ala Leu Ile Glu  
115 120 125

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Leu Val Asn Asn Gln Ile Tyr Pro Cys Val Pro Lys Lys Gly Ser Val  
 130 135 140  
 Gly Ala Ser Gly Asp Leu Ala Pro Leu Ala His Met Ser Thr Val Leu  
 145 150 155 160  
 Leu Gly Glu Gly Gln Ala Arg Asp Tyr Asn Gly Lys Ile Ile Ser Gly  
 165 170 175  
 Leu Glu Ala Met Lys Ile Ala Gly Leu Glu Pro Ile Thr Leu Ala Pro  
 180 185 190  
 Lys Glu Gly Leu Ala Leu Leu Asn Gly Thr Gln Ala Ser Thr Ala Phe  
 195 200 205  
 Ala Leu Glu Gly Leu Phe Val Ala Glu Asp Leu Phe Ala Ser Ala Thr  
 210 215 220  
 Val Cys Gly Ala Met Ser Val Glu Ala Ala Leu Gly Ser Arg Arg Pro  
 225 230 235 240  
 Phe Asp Pro Arg Ile His Arg Pro Val Arg Gly His Arg Thr Gln Met  
 245 250 255  
 Asp Ala Ala Thr Ala Tyr Arg His Leu Leu Val Ser Ser Glu Ile Gly  
 260 265 270  
 Gln Ser His Ser Asn Cys Glu Gly Lys Val Gln Asp Pro Tyr Ser Leu  
 275 280 285  
 Arg Cys Gln Pro Gln Val Met Gly Ala Cys Leu Gln Gln Ile Arg Ser  
 290 295 300  
 Ala Ala Glu Val Leu Glu Val Glu Ala Asn Ser Val Ser Asp Asn Pro  
 305 310 315 320  
 Leu Val Phe Ala Asp Gly Asp Ile Ile Ser Gly Gly Asn Phe His Ala  
 325 330 335  
 Glu Pro Val Ala Met Ala Ala Asp Asn Leu Ala Leu Ala Ile Ala Glu  
 340 345 350  
 Ile Gly Ser Leu Ser Glu Arg Arg Met Ala Leu Leu Ile Asp Ser Ala  
 355 360 365  
 Leu Ser Lys Asp Leu Pro Pro Phe Leu Val Asp Asn Gly Gly Val Asn  
 370 375 380  
 Ser Gly Phe Met Ile Ala Gln Val Thr Ala Ala Ala Leu Ala Ser Glu  
 385 390 395 400  
 Asn Lys Thr Leu Ala His Pro Ala Ser Val Asp Ser Leu Pro Thr Ser  
 405 410 415  
 Ala Asn Gln Glu Asp His Val Ser Met Ala Thr Phe Ala Ala Arg Arg  
 420 425 430

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<210> 51
<211> 513
<212> PRT
<213> Pseudomonas aeruginosa

<400> 51
Met Ala Ser Ala Met Ser Leu His Leu Lys Pro Gly Gln Leu Thr Leu
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Ala Asp Leu Arg Gln Ala Tyr Leu Ala Pro Val Arg Leu Ser Leu Asp
      20          25          30
Pro Ser Ala Asp Ala Pro Ile Ala Ala Ser Val Ala Cys Val Glu Asn
      35          40          45
Ile Ile Ala Glu Gly Arg Thr Ala Tyr Gly Ile Asn Thr Gly Phe Gly
      50          55          60
Leu Leu Ala Ser Thr Arg Ile Ser Pro Ala Asp Leu Glu Lys Leu Gln
      65          70          75          80
Arg Ser Ile Val Leu Ser His Ala Ala Gly Val Gly Glu Ala Leu Asp
      85          90          95
Asp Ala Met Val Arg Leu Val Met Leu Leu Lys Val Asn Ser Leu Ala
      100         105         110
Arg Gly Phe Ser Gly Ile Arg Arg Lys Val Ile Asp Ala Leu Ile Ala
      115         120         125
Leu Ile Asn Ala Glu Val Tyr Pro His Ile Pro Leu Lys Gly Ser Val
      130         135         140
Gly Ala Ser Gly Asp Leu Ala Pro Leu Ala His Met Ser Leu Val Leu
      145         150         155         160
Ile Gly Glu Ser Arg Ala Arg His Ala Arg Gly Glu Trp Leu Pro Ala
      165         170         175

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Ala Glu Ala Leu Ala Val Ala Gly Leu Glu Pro Leu Thr Leu Ala Ala  
 180 185 190  
 Lys Glu Gly Leu Ala Leu Leu Asn Gly Thr Gln Val Ser Thr Ala Tyr  
 195 200 205  
 Ala Leu Arg Gly Leu Phe Glu Ala Glu Asp Leu Phe Ala Ala Ala Thr  
 210 215 220  
 Val Cys Gly Gly Leu Ser Val Glu Ala Met Leu Gly Ser Arg Ala Pro  
 225 230 235 240  
 Phe Asp Ala Arg Ile His Ala Ala Leu Arg Gly Gln Arg Gly Gln Ile  
 245 250 255  
 Asp Val Ala Ala Ala Tyr Arg Asp Leu Leu Ala Ser Ser Glu Val Ala  
 260 265 270  
 Arg Ser His Glu Lys Cys Asp Gly Lys Val Gln Asp Pro Tyr Ser Leu  
 275 280 285  
 Arg Cys Gln Pro Gln Val Met Gly Ala Cys Leu Thr Gln Met Arg Gln  
 290 295 300  
 Ala Ala Glu Val Leu Glu Ile Glu Ala Asn Ala Val Ser Asp Asn Pro  
 305 310 315 320  
 Leu Val Phe Ala Ala Gly Asp Val Ile Ser Gly Gly Asn Phe His Ala  
 325 330 335  
 Glu Pro Val Ala Met Ala Ala Asp Asn Leu Ala Leu Ala Leu Ala Glu  
 340 345 350  
 Ile Gly Ser Leu Ser Glu Arg Arg Ile Ser Leu Met Met Asp Met His  
 355 360 365  
 Met Ser Gln Asp Leu Pro Pro Phe Leu Val Ala Asn Gly Gly Val Asn  
 370 375 380  
 Ser Gly Phe Met Ile Ala Gln Val Thr Ala Ala Ala Leu Ala Ser Asp  
 385 390 395 400  
 Asn Lys Ala Leu Ala His Pro Ala Ser Val Asp Ser Leu Pro Thr Ser  
 405 410 415  
 Ala Asn Gln Glu Asp His Val Ser Met Ala Pro Asn Ala Gly Lys Arg  
 420 425 430  
 Leu Trp Ala Met Ala Glu Asn Val Arg Gly Ile Leu Ala Val Glu Trp  
 435 440 445  
 Leu Gly Ala Cys Gln Gly Leu Asp Phe Arg Glu Gly Leu Lys Ser Ser  
 450 455 460  
 Pro Lys Leu Glu Gln Ala Arg Arg Leu Leu Arg Asp Lys Val Pro Tyr  
 465 470 475 480

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Tyr Gln Glu Asp Arg Phe Phe Ala Pro Asp Ile Glu Ala Ala Ser Gln  
 485 490 495

Leu Leu Ala Ser Gly Cys Leu Asn Ala Leu Leu Pro Ala Arg Leu Leu  
 500 505 510

Pro

<210> 52

<211> 513

<212> PRT

<213> Bacillus halodurans

<400> 52

Met Ala Met Thr Asn Leu Lys Leu Leu Asp Gly Arg Ser Leu Ser Leu  
 1 5 10 15

His Asp Leu His Arg Ile Ile Tyr Glu Gly Glu Thr Val Gly Ala Ser  
 20 25 30

Asp Glu Ser Met Glu Lys Val Lys Gln Ser Arg Lys Ala Val Glu Gln  
 35 40 45

Ile Val Ala Asp Glu Lys Ile Ile Tyr Gly Ile Thr Thr Gly Phe Gly  
 50 55 60

Lys Phe Ser Asp Ile Phe Ile Asp Pro Asp Asp Val Glu Asn Leu Gln  
 65 70 75 80

His Asn Leu Ile Tyr Ser His Ala Cys Gly Val Gly Ser Pro Phe Pro  
 85 90 95

Glu Thr Val Ser Arg Thr Met Leu Val Leu Arg Ala Asn Ala Leu Leu  
 100 105 110

Lys Gly Phe Ser Gly Val Arg Pro Leu Val Ile Glu Arg Leu Leu Ala  
 115 120 125

Leu Val Asn Ala Asn Ile His Pro Val Ile Pro Gln Gln Gly Ser Leu  
 130 135 140

Gly Ala Ser Gly Asp Leu Ala Pro Leu Ser His Leu Ala Leu Val Leu  
 145 150 155 160

Leu Gly Glu Gly Glu Val Phe Asp Tyr Lys Gly Thr Lys Thr Lys Ala  
 165 170 175

Ser Phe Ala Leu Lys Glu Glu Glu Ile Glu Pro Ile Thr Leu Thr Ala  
 180 185 190

Lys Glu Gly Leu Ala Leu Ile Asn Gly Thr Gln Ala Met Thr Ala Met  
 195 200 205

Gly Val Ile Ala Tyr Leu Glu Ala Glu Lys Leu Ala Phe Gln Ser Glu  
 210 215 220

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Arg

<210> 53  
 <211> 513  
 <212> PRT  
 <213> Pseudomonas putida

<400> 53

Met	Ala	Ser	Ala	Thr	Glu	Leu	Thr	Leu	Lys	Pro	Gly	Thr	Leu	Thr	Leu	1	5	10	15
Ala	Gln	Leu	Arg	Ala	Ile	His	Ala	Ala	Pro	Val	Arg	Leu	Gln	Leu	Asp	20	25	30	
Ala	Ser	Ala	Ala	Pro	Ala	Ile	Asp	Ala	Ser	Val	Ala	Cys	Val	Glu	Gln	35	40	45	
Ile	Ile	Ala	Glu	Asp	Arg	Thr	Ala	Tyr	Gly	Ile	Asn	Thr	Gly	Phe	Gly	50	55	60	
Leu	Leu	Ala	Ser	Thr	Arg	Ile	Ala	Ser	His	Asp	Leu	Glu	Asn	Leu	Gln	65	70	75	80
Arg	Ser	Leu	Val	Leu	Ser	His	Ala	Ala	Gly	Ile	Gly	Ala	Pro	Leu	Asp	85	90	95	
Asp	Asp	Leu	Val	Arg	Leu	Ile	Met	Val	Leu	Lys	Ile	Asn	Ser	Leu	Ser	100	105	110	
Arg	Gly	Phe	Ser	Gly	Ile	Arg	Arg	Lys	Val	Ile	Asp	Ala	Leu	Ile	Ala	115	120	125	
Leu	Val	Asn	Ala	Glu	Val	Tyr	Pro	His	Ile	Pro	Leu	Lys	Gly	Ser	Val	130	135	140	
Gly	Ala	Ser	Gly	Asp	Leu	Ala	Pro	Leu	Ala	His	Met	Ser	Leu	Val	Leu	145	150	155	160
Leu	Gly	Glu	Gly	Lys	Ala	Arg	Asp	Tyr	Lys	Gly	Gln	Trp	Leu	Ser	Ala	165	170	175	
Thr	Glu	Ala	Leu	Ala	Val	Ala	Gly	Leu	Glu	Pro	Leu	Thr	Leu	Ala	Ala	180	185	190	
Lys	Glu	Gly	Leu	Ala	Leu	Leu	Asn	Gly	Thr	Gln	Ala	Ser	Thr	Ala	Tyr	195	200	205	
Ala	Leu	Arg	Gly	Leu	Phe	Tyr	Ala	Glu	Asp	Leu	Tyr	Ala	Ala	Ala	Ile	210	215	220	
Ala	Cys	Gly	Gly	Leu	Ser	Val	Glu	Ala	Val	Leu	Gly	Ser	Arg	Ser	Pro	225	230	235	240
Phe	Asp	Ala	Arg	Ile	His	Glu	Ala	Leu	Arg	Gly	Gln	Arg	Gly	Gln	Ile	245	250	255	
Asp	Thr	Ala	Ala	Cys	Phe	Arg	Asp	Leu	Leu	Gly	Asp	Ser	Ser	Glu	Val	260	265	270	

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Ser Ser His Lys Asn Cys Asp Gly Lys Val Gln Asp Pro Tyr Ser Leu  
 275 280 285  
 Arg Cys Gln Pro Gln Val Met Gly Ala Cys Leu Thr Gln Leu Arg Gln  
 290 295 300  
 Ala Ala Glu Val Leu Gly Ile Glu Ala Asn Ala Val Ser Asp Asn Pro  
 305 310 315 320  
 Leu Val Phe Ala Ala Gly Asp Val Ile Ser Gly Gly Asn Phe His Ala  
 325 330 335  
 Glu Pro Val Ala Met Ala Ala Asp Asn Leu Ala Leu Ala Ile Ala Glu  
 340 345 350  
 Ile Gly Ser Leu Ser Glu Arg Arg Ile Ser Leu Met Met Asp Lys His  
 355 360 365  
 Met Ser Gln Asp Leu Pro Pro Phe Leu Val Glu Asn Gly Gly Val Asn  
 370 375 380  
 Ser Gly Phe Met Ile Ala Gln Val Thr Ala Ala Ala Leu Ala Ser Glu  
 385 390 395 400  
 Asn Lys Ala Leu Ser His Pro His Ser Val Asp Ser Leu Pro Thr Ser  
 405 410 415  
 Ala Asn Gln Glu Asp His Val Ser Met Ala Pro Ala Ala Gly Lys Arg  
 420 425 430  
 Leu Trp Glu Met Ala Glu Asn Thr Arg Gly Val Leu Ala Ile Glu Trp  
 435 440 445  
 Leu Gly Ala Cys Gln Gly Leu Asp Leu Arg Lys Gly Leu Lys Thr Ser  
 450 455 460  
 Ala Lys Leu Glu Lys Ala Arg Gln Ala Leu Arg Ser Glu Val Ala His  
 465 470 475 480  
 Tyr Asp Arg Asp Arg Phe Phe Ala Pro Asp Ile Glu Lys Ala Val Glu  
 485 490 495  
 Leu Leu Ala Lys Gly Ser Leu Thr Gly Leu Leu Pro Ala Gly Leu Pro  
 500 505 510  
 Ser

<210> 54  
 <211> 513  
 <212> PRT  
 <213> Rhizobium meliloti

<400> 54  
 Met Ala Ser Ala Pro Gln Ile Thr Leu Arg Pro Gly Ser Val Pro Leu  
 1 5 10 15

Ser Asp Leu Glu Thr Ile Tyr Trp Thr Gly Ala Pro Ala Arg Leu Asp  
 20 25 30  
 Ala Ala Phe Asp Ala Gly Ile Ala Lys Ala Ala Ala Arg Ile Ala Glu  
 35 40 45  
 Ile Val Ala Gly Asn Ala Pro Val Tyr Gly Ile Asn Thr Gly Phe Gly  
 50 55 60  
 Lys Leu Ala Ser Ile Lys Ile Asp Ser Ser Asp Val Ala Thr Leu Gln  
 65 70 75 80  
 Arg Asn Leu Ile Leu Ser His Cys Cys Gly Val Gly Gln Pro Leu Thr  
 85 90 95  
 Glu Asp Ile Val Arg Leu Ile Met Ala Leu Lys Leu Ile Ser Leu Gly  
 100 105 110  
 Arg Gly Ala Ser Gly Val Arg Leu Glu Leu Val Arg Leu Ile Glu Ala  
 115 120 125  
 Met Leu Asp Lys Gly Val Ile Pro Leu Ile Pro Glu Lys Gly Ser Val  
 130 135 140  
 Gly Ala Ser Gly Asp Leu Ala Pro Leu Ala His Met Ala Ala Val Met  
 145 150 155 160  
 Met Gly His Gly Glu Ala Phe Phe Ala Gly Glu Arg Met Lys Gly Asp  
 165 170 175  
 Ala Ala Leu Lys Ala Glu Ala Gly Leu Ser Pro Val Thr Leu Ala Ala  
 180 185 190  
 Lys Glu Gly Leu Ala Leu Ile Asn Gly Thr Gln Val Ser Thr Ala Leu  
 195 200 205  
 Ala Leu Ala Gly Leu Phe Arg Ala His Arg Ala Gly Gln Ala Ala Leu  
 210 215 220  
 Ile Thr Gly Ala Leu Ser Thr Asp Ala Ala Met Gly Ser Ser Ala Pro  
 225 230 235 240  
 Phe His Pro Asp Ile Gln His Cys Ala Ala Ile Arg Ala Arg Ser Thr  
 245 250 255  
 Arg Ala Ala Ala Asn Leu Arg Gln Leu Leu Thr Gly Ser Pro Ile Arg  
 260 265 270  
 Gln Ser His Ile Glu Gly Asp Glu Arg Val Gln Asp Pro Tyr Cys Ile  
 275 280 285  
 Arg Cys Gln Pro Gln Val Asp Gly Ala Cys Leu Asp Leu Leu Arg Ser  
 290 295 300  
 Val Ala Ala Thr Leu Thr Ile Glu Ala Asn Ala Val Thr Asp Asn Pro  
 305 310 315 320

Leu Val Leu Ser Asp Asn Ser Val Val Ser Gly Gly Asn Phe His Ala  
 325 330 335  
 Glu Pro Val Ala Phe Ala Ala Asp Gln Ile Ala Leu Ala Val Cys Glu  
 340 345 350  
 Ile Gly Ala Ile Ser Gln Arg Arg Ile Ala Leu Leu Val Asp Pro Ala  
 355 360 365  
 Leu Ser Leu Arg Leu Pro Ala Phe Leu Ala Lys Lys Pro Gly Leu Asn  
 370 375 380  
 Ser Gly Leu Met Ile Ala Glu Val Thr Ser Ala Ala Leu Met Ser Glu  
 385 390 395 400  
 Asn Lys Gln Leu Ser His Pro Ala Ser Val Asp Ser Thr Pro Thr Ser  
 405 410 415  
 Ala Asn Gln Glu Asp His Val Ser Met Ala Cys His Gly Ala Arg Arg  
 420 425 430  
 Leu Leu Gln Met Thr Glu Asn Leu Phe Ser Ile Ile Gly Ile Glu Ala  
 435 440 445  
 Leu Ala Ala Val Gln Gly Ile Glu Phe Arg Ala Pro Leu Thr Thr Ser  
 450 455 460  
 Pro Glu Leu Gln Lys Ala Ala Ala Ala Val Arg Gly Val Ser Ser Ser  
 465 470 475 480  
 Ile Glu Glu Asp Arg Tyr Met Ala Asp Asp Leu Lys Ala Ala Gly Asp  
 485 490 495  
 Leu Val Ala Ser Gly Arg Leu Ala Ala Ala Val Ser Ala Gly Leu Pro  
 500 505 510  
 Lys

&lt;210&gt; 55

&lt;211&gt; 513

&lt;212&gt; PRT

&lt;213&gt; Pseudomonas aeruginosa

&lt;400&gt; 55

Met Ser Asp Leu Pro Ser Val Val Phe Gly Asp Gly Pro Leu Arg Trp  
 1 5 10 15

Gln Glu Leu Val Ala Val Ala Arg His Gly Ala Arg Leu Glu Leu Ser  
 20 25 30

Ala Ala Ala Trp Ala Arg Ile Asp Asn Ala Arg Ala Ile Val Cys Arg  
 35 40 45

Ile Val Ala Asn Gly Glu Arg Ala Tyr Gly Ile Ser Thr Gly Leu Gly  
 50 55 60

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 T09T20.542E860

Ala 65	Leu	Cys	Asp	Val	Leu 70	Leu	Glu	Gly	Glu	Gln 75	Leu	Ala	Glu	Leu	Ser 80
Arg	Asn	Thr	Leu	Leu 85	Ser	His	Ala	Cys	Gly 90	Val	Gly	Glu	Pro	Leu 95	Arg
Asp	Glu	Gln	Thr 100	Arg	Ala	Ile	Ile	Cys 105	Ala	Ala	Val	Ala	Asn 110	Tyr	Ser
Gln	Gly	Lys 115	Ser	Gly	Leu	Asp	Arg 120	Ser	Leu	Val	Glu	Gly 125	Leu	Leu	Ala
Leu	Leu 130	Asn	His	Gly	Ile	Thr 135	Pro	Gln	Val	Pro	Ala 140	Gln	Gly	Ser	Val
Gly 145	Tyr	Ser	Gly	Asp	Leu 150	Thr	His	Met	Ala	His 155	Val	Gly	Ile	Ala	Leu 160
Leu	Gly	Ile	Gly	Glu 165	Val	Ser	Asp	Tyr	Arg 170	Gly	Ser	Val	Val	Pro 175	Ala
Ala	Ala	Ala	Leu 180	Ala	Ala	Glu	Gly	Leu 185	Ala	Thr	Val	Arg	Leu 190	Gly	Ala
Lys	Asp	Gly 195	Leu	Cys	Leu	Val	Asn 200	Gly	Thr	Pro	Cys	Met 205	Thr	Gly	Leu
Ala	Cys 210	Leu	Ala	Leu	Asp	Asp 215	Ala	Gln	Arg	Leu	Ala 220	Gln	Trp	Ala	Asp
Val 225	Ile	Gly	Ala	Met	Ser 230	Phe	Glu	Ala	Leu	Arg 235	Gly	Gln	Leu	Ala 240	Ala
Phe	Asp	Ala	Glu	Ile 245	His	Val	Ala	Leu	Lys 250	Pro	His	Pro	Gly	Met 255	Gln
Arg	Val	Ala	Ala 260	Asn	Leu	Arg	Ala	Leu 265	Leu	Ala	Gly	Ser	Gln 270	Val	Leu
Glu	Asn	Ala 275	Arg	Glu	Gly	Gly	Ile 280	Arg	Thr	Gln	Asp	Ala 285	Leu	Ser	Ile
Arg	Ser 290	Ile	Pro	Gln	Ile	His 295	Gly	Ala	Cys	Arg	Asp 300	Gln	Leu	Ala	His
Ala 305	Arg	Gln	Ile	Glu	Thr 310	Arg	Glu	Leu	Asn	Ser 315	Ala	Thr	Asp	Asn	Pro 320
Leu	Leu	Leu	Gly	Thr 325	Pro	Glu	Val	Val	Ser 330	Gln	Ala	Asn	Pro	His 335	Gly
Glu	Ser	Val	Ala 340	Met	Ala	Ala	Asp	Leu 345	Leu	Ala	Ile	Ala 350	Val	Ala	Glu
Leu	Gly	Gly 355	Val	Ala	Glu	Arg	Arg 360	Leu	Asp	Arg	Leu	Val 365	Asn	Pro	Leu



Val Ser Arg Gly Leu Pro Ala Phe Leu Val Gly Lys Pro Gly Val Asn  
 370 375 380

Ser Gly Met Met Ile Thr Gln Tyr Val Ala Ala Ser Leu Ala Gly Glu  
 385 390 395 400

Asn Arg Gln Leu Ala Gln Pro Ala Val Val Asp Asn Phe Val Thr Ser  
 405 410 415

Ala Leu Gln Glu Asp His Leu Ser Leu Gly Thr Ser Ala Ala Leu Lys  
 420 425 430

Leu Gly Arg Ala Leu Glu Asn Leu Arg Arg Ile Leu Ala Ile Glu Tyr  
 435 440 445

Leu Leu Ala Ala Gln Ala Phe Glu Phe Leu Ala Pro Gln Arg Phe Gly  
 450 455 460

Gln Gly Thr Ala Ala Ala Trp Gly Ile Leu Arg Glu Arg Val Pro Ala  
 465 470 475 480

Tyr Asp Thr Asp Arg Trp Leu Ala Pro Asp Ile Ala Ser Ala Ala Ala  
 485 490 495

Ile Leu Gly Glu Arg Lys Ser Leu Ala Arg Leu Ala Ala Ser Ile Gly  
 500 505 510

Asp

<210> 56  
 <211> 513  
 <212> PRT  
 <213> Homo sapiens

<400> 56  
 Lys Tyr Arg Glu Pro Glu Lys Tyr Ile Glu Leu Asp Gly Leu Thr Thr  
 1 5 10 15

Glu Asp Leu Val Asn Leu Gly Lys Gly Arg Tyr Lys Ile Lys Leu Thr  
 20 25 30

Pro Thr Ala Glu Lys Arg Val Gln Lys Ser Arg Glu Val Ile Asp Ser  
 35 40 45

Ile Ile Lys Glu Lys Thr Val Val Tyr Gly Ile Thr Thr Gly Phe Gly  
 50 55 60

Lys Phe Ala Thr Arg Thr Val Ile Pro Ile Asn Lys Leu Gln Leu Gln  
 65 70 75 80

Val Asn Leu Val Arg Ser His Ser Ser Gly Val Gly Lys Pro Leu Ser  
 85 90 95

Pro Glu Arg Cys Arg Met Leu Leu Ala Leu Arg Ile Asn Val Leu Ala  
 100 105 110

003345.0301

Lys	Gly	Tyr	Ser	Gly	Ile	Ser	Leu	Glu	Thr	Leu	Lys	Gln	Val	Ile	Glu
115						120				125					
Met	Phe	Asn	Ala	Ser	Cys	Leu	Pro	Tyr	Val	Pro	Glu	Lys	Gly	Thr	Val
130						135				140					
Gly	Ala	Ser	Gly	Asp	Leu	Ala	Pro	Leu	Ser	His	Leu	Ala	Leu	Gly	Leu
145				150						155		160			
Val	Gly	Glu	Gly	Lys	Met	Trp	Ser	Pro	Lys	Ser	Gly	Trp	Ala	Asp	Ala
				165				170						175	
Lys	Tyr	Val	Leu	Glu	Ala	His	Gly	Leu	Lys	Pro	Val	Ile	Leu	Lys	Pro
		180						185				190			
Lys	Glu	Gly	Leu	Ala	Leu	Ile	Asn	Gly	Thr	Gln	Met	Ile	Thr	Ser	Leu
		195				200						205			
Gly	Cys	Glu	Ala	Val	Glu	Arg	Ala	Ser	Ala	Ile	Ala	Arg	Gln	Ala	Asp
210						215				220					
Ile	Val	Ala	Ala	Leu	Thr	Leu	Glu	Val	Leu	Lys	Gly	Thr	Thr	Lys	Ala
225				230						235				240	
Phe	Asp	Thr	Asp	Ile	His	Ala	Pro	Leu	Arg	Pro	His	Arg	Gly	Gln	Ile
				245				250						255	
Glu	Val	Ala	Phe	Arg	Phe	Arg	Ser	Leu	Leu	Ser	Asp	Ser	Glu	Ile	Ala
		260						265				270			
Glu	Ser	His	Arg	Phe	Cys	Asp	Gly	Arg	Val	Gln	Asp	Ala	Tyr	Thr	Leu
		275				280						285			
Arg	Cys	Cys	Pro	Gln	Val	His	Gly	Val	Val	Asn	Asp	Thr	Ile	Ala	Phe
290						295				300					
Val	Lys	Asn	Ile	Ile	Thr	Thr	Glu	Leu	Asn	Ser	Ala	Thr	Asp	Asn	Pro
305				310						315		320			
Met	Val	Phe	Ala	Asn	Gly	Glu	Thr	Val	Ser	Gly	Gly	Asn	Phe	His	Gly
				325				330						335	
Glu	Tyr	Pro	Ala	Lys	Ala	Leu	Asp	Tyr	Leu	Ala	Ile	Gly	Ile	His	Glu
		340						345				350			
Leu	Ala	Ala	Ile	Ser	Glu	Arg	Arg	Ile	Glu	Arg	Leu	Cys	Asn	Pro	Ser
355						360						365			
Leu	Ser	Arg	Glu	Leu	Pro	Ala	Phe	Leu	Val	Ala	Glu	Gly	Gly	Leu	Asn
370						375				380					
Ser	Gly	Phe	Met	Ile	Ala	His	Cys	Thr	Ala	Ala	Ala	Leu	Val	Ser	Glu
385				390						395		400			
Asn	Lys	Ala	Leu	Cys	His	Pro	Ser	Ser	Val	Asp	Ser	Leu	Ser	Thr	Ser
				405				410						415	

Ala Ala Thr Glu Asp His Val Ser Met Gly Gly Trp Ala Ala Arg Lys  
420 425 430

Ala Leu Arg Val Ile Glu His Val Glu Gln Val Leu Ala Ile Glu Leu  
435 440 445

Leu Ala Ala Cys Gln Gly Ile Glu Phe Leu Arg Pro Leu Lys Thr Thr  
450 455 460

Thr Pro Leu Glu Lys Val Tyr Asp Leu Val Arg Ser Val Val Arg Pro  
465 470 475 480

Trp Ile Lys Asp Arg Phe Met Ala Pro Asp Ile Glu Ala Ala His Arg  
485 490 495

Leu Leu Leu Glu Gln Lys Val Trp Glu Val Ala Ala Pro Tyr Ile Glu  
500 505 510

Lys

<210> 57

<211> 513

<212> PRT

<213> Caenorhabditis elegans

<400> 57

Val Leu Ala Pro Pro Thr Lys Leu Leu Ile Leu Asp Gly Asn Ser Pro  
1 5 10 15

Glu Asp Leu Val Arg Cys Glu Lys Gly Glu Cys Ala Ile Gln Leu Ser  
20 25 30

Met Glu Ser Glu Asp Arg Ile Arg Lys Ala Arg Thr Phe Leu Glu Lys  
35 40 45

Ile Ala Ser Glu His Arg Ala Val Tyr Gly Val Thr Thr Gly Phe Gly  
50 55 60

Thr Phe Ser Asn Val Thr Ile Pro Pro Glu Lys Leu Lys Lys Leu Gln  
65 70 75 80

Leu Asn Leu Ile Arg Ser His Ala Thr Gly Tyr Gly Glu Pro Leu Ala  
85 90 95

Pro Asn Arg Ala Arg Met Leu Leu Ala Leu Arg Ile Asn Ile Leu Ala  
100 105 110

Lys Gly His Ser Gly Ile Ser Val Glu Asn Ile Lys Lys Met Ile Ala  
115 120 125

Ala Phe Asn Ala Phe Cys Val Ser Tyr Val Pro Gln Gln Gly Thr Val  
130 135 140

Gly Cys Ser Gly Asp Leu Cys Pro Leu Ala His Leu Ala Leu Gly Leu  
145 150 155 160

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Leu	Gly	Glu	Gly	Lys	Met	Trp	Ser	Pro	Thr	Thr	Gly	Trp	Gln	Pro	Ala	
				165					170					175		
Asp	Val	Val	Leu	Lys	Lys	Asn	Asn	Leu	Glu	Pro	Leu	Glu	Leu	Gly	Pro	
				180					185					190		
Lys	Glu	Gly	Leu	Ala	Leu	Ile	Asn	Gly	Thr	Gln	Met	Val	Thr	Ala	Leu	
				195					200					205		
Gly	Ala	Tyr	Thr	Leu	Glu	Arg	Ala	His	Asn	Ile	Ala	Arg	Gln	Ala	Asp	
				210					215					220		
Val	Ile	Ala	Ala	Leu	Ser	Leu	Asp	Val	Leu	Lys	Gly	Thr	Thr	Arg	Ala	
				225					230					235		
Tyr	Asp	Pro	Asp	Ile	His	Arg	Pro	Ile	Arg	Pro	His	Arg	Gly	Gln	Asn	
				245					250					255		
Leu	Ser	Ala	Leu	Arg	Leu	Arg	Ala	Leu	Leu	Asn	Pro	Ser	Gln	Ile	Ala	
				260					265					270		
Glu	Ser	His	Arg	Asn	Cys	Thr	Gly	Lys	Val	Gln	Asp	Ala	Tyr	Thr	Leu	
				275					280					285		
Arg	Cys	Val	Pro	Gln	Val	His	Gly	Val	Val	His	Asp	Thr	Ile	Glu	Phe	
				290					295					300		
Val	Arg	Glu	Ile	Ile	Thr	Thr	Glu	Met	Asn	Ser	Ala	Thr	Asp	Asn	Pro	
				305					310					315		
Leu	Val	Phe	Ala	Asp	Arg	Glu	Ile	Ile	Ser	Gly	Gly	Asn	Phe	His	Gly	
				325					330					335		
Glu	Tyr	Pro	Ala	Lys	Ala	Leu	Asp	Phe	Leu	Ala	Ile	Ala	Val	Ala	Glu	
				340					345					350		
Leu	Ala	Gln	Met	Ser	Glu	Arg	Arg	Leu	Glu	Arg	Leu	Val	Asn	Lys	Glu	
				355					360					365		
Leu	Ser	Arg	Gly	Leu	Pro	Thr	Phe	Leu	Thr	Pro	Asp	Gly	Gly	Leu	Asn	
				370					375					380		
Ser	Gly	Phe	Met	Thr	Val	Gln	Leu	Cys	Ala	Ala	Ser	Leu	Val	Ser	Glu	
				385					390					395		
Asn	Lys	Val	Leu	Cys	His	Pro	Ser	Ser	Val	Asp	Ser	Ile	Pro	Thr	Ser	
				405					410					415		
Cys	Asn	Gln	Glu	Asp	His	Val	Ser	Met	Gly	Gly	Phe	Ala	Ala	Arg	Lys	
				420					425					430		
Ala	Leu	Thr	Val	Val	Glu	His	Val	Glu	Ala	Val	Leu	Ala	Met	Glu	Leu	
				435					440					445		
Leu	Ala	Ala	Cys	Gln	Gly	Ile	Glu	Phe	Leu	Lys	Pro	Leu	Ile	Ser	Thr	
				450					455					460		

Ala Pro Leu His Lys Ile Tyr Gln Leu Val Arg Ser Lys Val Ala Pro  
465 470 475 480

Pro Asn Glu Asp Arg Tyr Met Lys Pro Glu Ile Asp Ala Val Leu Glu  
485 490 495

Met Ile Arg Glu Asn Arg Ile Trp Glu Ala Val Leu Pro His Leu Glu  
500 505 510

Thr

<210> 58

<211> 513

<212> PRT

<213> Thermoplasma acidophilum

<400> 58

Met Ala Ser Ala Pro Met Ile Glu Ile Asp Gly Arg Ser Leu Arg Val  
1 5 10 15

Glu Asp Val Tyr Ala Val Ala Val Glu Tyr Asp Arg Val Ser Ile Ser  
20 25 30

Asp Asp Thr Leu Lys Ala Val Glu Glu Lys His Glu Ala Phe Leu Lys  
35 40 45

Leu Ile Asn Ser Gly Lys Thr Val Tyr Gly Val Asn Thr Gly Phe Gly  
50 55 60

Ser Leu Leu Asn Val His Ile Glu Arg Asp Gln Glu Ile Glu Leu Gln  
65 70 75 80

Lys Asn Leu Ile Arg Ser His Ser Ser Gly Val Gly Asp Tyr Leu Glu  
85 90 95

Asn Arg Tyr Val Arg Ala Ile Met Ala Val Arg Leu Asn Ser Leu Ala  
100 105 110

Ala Gly Tyr Ser Ala Val Ser Ala Asp Leu Leu Asn Met Met Val Glu  
115 120 125

Met Leu Asn Arg Asp Val Ile Pro Ala Val Pro Lys Tyr Gly Ser Val  
130 135 140

Gly Ala Ser Gly Asp Leu Ala Pro Leu Ala His Ile Gly Leu Ala Met  
145 150 155 160

Met Gly Glu Gly Lys Ala Phe Asp Phe Glu Gly Arg Leu Met Asp Ser  
165 170 175

Ala Arg Ala Leu Glu Lys Ala Gly Leu Lys Pro Tyr Gln Phe Lys Glu  
180 185 190

Lys Glu Gly Val Ala Leu Ile Asn Gly Thr Ser Phe Met Ser Gly Ile  
195 200 205

0993745-07304

Leu Ser Ile Ala Val Met Asp Ala His Asp Ile Leu Glu Asn Ala Ile  
 210 215 220  
 Arg Ser Ala Leu Leu Ser Phe Glu Ala Leu Gly Gly Thr Ser Lys Ala  
 225 230 235 240  
 Phe Thr Pro Trp Ile Leu Gly Ala Leu Arg Pro His Leu Gly Gln Val  
 245 250 255  
 Ala Ile Gly Asn Arg Phe Arg Glu Tyr Leu Thr Gly Ser Asp Ile Val  
 260 265 270  
 Ala Ser Lys Arg Ala Asp Ser Val Lys Val Gln Asp Ala Tyr Thr Leu  
 275 280 285  
 Arg Cys Ile Pro Gln Val Tyr Gly Ser Val Ala Asp Val Ile Asp Tyr  
 290 295 300  
 Val Glu Asn Val Leu Ser Val Glu Ile Asn Ser Ala Thr Asp Asn Pro  
 305 310 315 320  
 Leu Val Phe Asn Gly Glu Glu Val Val Ser Gly Gly Asn Phe His Gly  
 325 330 335  
 Glu Pro Val Ala Leu Ala Ala Asp Phe Leu Ala Ile Ala Leu Thr Asp  
 340 345 350  
 Leu Gly Asn Met Val Glu Arg Arg Ile Ala Arg Leu Val Asp Thr Asn  
 355 360 365  
 Leu Ser Arg Gly Leu Pro Pro Phe Leu Thr Pro Asp Ser Gly Leu Asn  
 370 375 380  
 Ser Gly Tyr Met Ile Pro Gln Tyr Thr Ala Ala Ala Leu Cys Asn Arg  
 385 390 395 400  
 Asn Lys Val Leu Ala Tyr Pro Ser Ser Ala Asp Thr Ile Pro Thr Ser  
 405 410 415  
 Ala Asn Gln Glu Asp His Val Ser Met Gly Ala Thr Gly Ser Leu Lys  
 420 425 430  
 Leu Leu Glu Ile Ile Asp Asn Val Arg Tyr Ile Ile Ala Ile Glu Tyr  
 435 440 445  
 Leu Leu Gly Ser Gln Ala Leu Glu Phe Thr Asp Lys Leu Gly Met Ser  
 450 455 460  
 Pro Ser Thr Arg Lys Ile Tyr Glu Lys Ile Arg Glu Lys Val Glu Lys  
 465 470 475 480  
 Leu Asp His Asp Arg Pro Pro Ser Phe Asp Ile Glu Thr Ile Arg Lys  
 485 490 495  
 Met Met Asp Lys Lys Glu Phe Ile Ser Ala Leu Pro Ala His Leu Pro  
 500 505 510

Ala

093345 011304

<210> 59  
 <211> 513  
 <212> PRT  
 <213> Mus sp.

<400> 59

Lys	Tyr	Arg	Glu	Pro	Glu	Lys	Tyr	Ile	Ala	Leu	Asp	Gly	Asp	Ser	Thr
1				5					10					15	
Glu	Asp	Leu	Val	Asn	Leu	Gly	Lys	Gly	Arg	Tyr	Lys	Ile	Lys	Leu	Thr
		20				25							30		
Ser	Ile	Ala	Glu	Lys	Lys	Val	Gln	Gln	Ser	Arg	Glu	Val	Ile	Asp	Ser
		35					40					45			
Ile	Ile	Lys	Glu	Arg	Thr	Val	Val	Tyr	Gly	Ile	Thr	Thr	Gly	Phe	Gly
	50					55					60				
Lys	Phe	Ala	Thr	Arg	Thr	Val	Ile	Pro	Ala	Asn	Lys	Leu	Gln	Leu	Gln
	65				70					75					80
Val	Asn	Leu	Val	Arg	Ser	His	Ser	Ser	Gly	Val	Gly	Lys	Pro	Leu	Ser
				85					90					95	
Pro	Glu	Arg	Cys	Arg	Met	Leu	Leu	Ala	Leu	Arg	Ile	Asn	Val	Leu	Ala
			100					105					110		
Lys	Gly	Tyr	Ser	Gly	Ile	Ser	Leu	Glu	Thr	Leu	Lys	Gln	Val	Ile	Glu
		115					120					125			
Ala	Phe	Asn	Ala	Ser	Cys	Leu	Ser	Tyr	Val	Pro	Glu	Lys	Gly	Thr	Val
		130				135					140				
Gly	Ala	Ser	Gly	Asp	Leu	Ala	Pro	Leu	Ser	His	Leu	Ala	Leu	Gly	Leu
	145				150					155					160
Ile	Gly	Glu	Gly	Lys	Met	Trp	Ser	Pro	Lys	Ser	Gly	Trp	Ala	Asp	Ala
				165					170					175	
Lys	Tyr	Val	Leu	Glu	Ala	His	Gly	Leu	Lys	Pro	Ile	Val	Leu	Lys	Pro
			180					185					190		
Lys	Glu	Gly	Leu	Ala	Leu	Ile	Asn	Gly	Thr	Gln	Met	Ile	Thr	Ser	Leu
		195					200					205			
Gly	Cys	Glu	Ala	Leu	Glu	Arg	Ala	Ser	Ala	Ile	Ala	Arg	Gln	Ala	Asp
	210					215					220				
Ile	Val	Ala	Ala	Leu	Thr	Leu	Glu	Val	Leu	Lys	Gly	Thr	Thr	Lys	Ala
	225				230					235					240
Phe	Asp	Thr	Asp	Ile	His	Ala	Pro	Val	Arg	Pro	His	Arg	Gly	Gln	Ile
				245					250					255	

00349 513 59

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<210> 60
<211> 513
<212> PRT
<213> Mus musculus
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&lt;400&gt; 60

Lys Tyr Arg Glu Pro Glu Lys Tyr Ile Ala Leu Asp Gly Asp Ser Thr  
 1 5 10 15  
 Glu Asp Leu Val Asn Leu Gly Lys Gly Arg Tyr Lys Ile Lys Leu Thr  
 20 25 30  
 Ser Ile Ala Glu Lys Lys Val Gln Gln Ser Arg Glu Val Ile Asp Ser  
 35 40 45  
 Ile Ile Lys Glu Arg Thr Val Val Tyr Gly Ile Thr Thr Gly Phe Gly  
 50 55 60  
 Lys Phe Ala Thr Arg Thr Val Ile Pro Ala Asn Lys Leu Gln Leu Gln  
 65 70 75 80  
 Val Asn Leu Val Arg Ser His Ser Ser Gly Val Gly Lys Pro Leu Ser  
 85 90 95  
 Pro Glu Arg Cys Arg Met Leu Leu Ala Leu Arg Ile Asn Val Leu Ala  
 100 105 110  
 Lys Gly Tyr Ser Gly Ile Ser Leu Glu Thr Leu Lys Gln Val Ile Glu  
 115 120 125  
 Ala Phe Asn Ala Ser Cys Leu Ser Tyr Val Pro Glu Lys Gly Thr Val  
 130 135 140  
 Gly Ala Ser Gly Asp Leu Ala Pro Leu Ser His Leu Ala Leu Gly Leu  
 145 150 155 160  
 Ile Gly Glu Gly Lys Met Trp Ser Pro Lys Ser Gly Trp Ala Asp Ala  
 165 170 175  
 Lys Tyr Val Leu Glu Ala His Gly Leu Lys Pro Ile Val Leu Lys Pro  
 180 185 190  
 Lys Glu Gly Leu Ala Leu Ile Asn Gly Thr Gln Met Ile Thr Ser Leu  
 195 200 205  
 Gly Cys Glu Ala Leu Glu Arg Ala Ser Ala Ile Ala Arg Gln Ala Asp  
 210 215 220  
 Ile Val Ala Ala Leu Thr Leu Glu Val Leu Lys Gly Thr Thr Lys Ala  
 225 230 235 240  
 Phe Asp Thr Asp Ile His Ala Pro Val Arg Pro His Arg Gly Gln Ile  
 245 250 255  
 Glu Val Ala Phe Arg Phe Arg Ser Leu Leu Ser Asp Ser Glu Ile Ala  
 260 265 270  
 Glu Ser His Arg Phe Cys Asp Gly Arg Val Gln Asp Ala Tyr Thr Leu  
 275 280 285  
 Arg Cys Cys Pro Gln Val His Gly Val Val Asn Asp Thr Ile Ala Phe  
 290 295 300

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 071801  
 001205

Val Lys Asp Ile Ile Thr Thr Glu Leu Asn Ser Ala Thr Asp Asn Pro  
 305 310 315 320  
 Met Val Phe Ala Ser Gly Glu Thr Ile Ser Gly Gly Asn Phe His Gly  
 325 330 335  
 Glu Tyr Pro Ala Lys Ala Leu Asp Tyr Leu Ala Ile Gly Val His Glu  
 340 345 350  
 Leu Ala Ala Ile Ser Glu Arg Arg Ile Glu Arg Leu Cys Asn Pro Ser  
 355 360 365  
 Leu Ser Arg Glu Leu Pro Ala Phe Leu Val Ala Glu Gly Gly Leu Asn  
 370 375 380  
 Ser Gly Phe Met Ile Ala His Cys Thr Ala Ala Ala Leu Val Ser Glu  
 385 390 395 400  
 Ser Lys Ala Leu Cys His Pro Ser Ser Val Asp Ser Leu Ser Thr Ser  
 405 410 415  
 Ala Ala Thr Glu Asp His Val Ser Met Gly Gly Trp Ala Ala Arg Lys  
 420 425 430  
 Ala Leu Arg Val Val Glu His Val Glu Gln Val Leu Ala Ile Glu Leu  
 435 440 445  
 Leu Ala Ala Cys Gln Gly Ile Glu Phe Leu Arg Pro Leu Lys Thr Thr  
 450 455 460  
 Thr Pro Leu Glu Lys Val Tyr Asp Leu Val Arg Ser Val Val Arg Pro  
 465 470 475 480  
 Trp Ile Lys Asp Arg Phe Met Ala Pro Asp Ile Glu Ala Ala His Arg  
 485 490 495  
 Leu Leu Leu Asp Gln Lys Val Trp Glu Val Ala Ala Pro Tyr Ile Glu  
 500 505 510  
 Lys

<210> 61  
 <211> 513  
 <212> PRT  
 <213> Rattus sp.

<400> 61  
 Lys Tyr Arg Glu Pro Glu Lys Tyr Ile Ala Leu Asp Gly Asp Ser Thr  
 1 5 10 15  
 Glu Asp Leu Val Asn Leu Gly Lys Gly His Tyr Lys Ile Lys Leu Thr  
 20 25 30  
 Ser Ile Ala Glu Lys Lys Val Gln Gln Ser Arg Glu Val Ile Asp Ser  
 35 40 45

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Ile Ile Lys Glu Arg Thr Val Val Tyr Gly Ile Thr Thr Gly Phe Gly  
 50 55 60  
 Lys Phe Ala Thr Arg Thr Val Ile Pro Ala Asn Lys Leu Gln Leu Gln  
 65 70 75 80  
 Val Asn Leu Val Arg Ser His Ser Ser Gly Val Gly Lys Pro Leu Ser  
 85 90 95  
 Pro Glu Arg Cys Arg Met Leu Leu Ala Leu Arg Ile Asn Val Leu Ala  
 100 105 110  
 Lys Gly Tyr Ser Gly Ile Ser Leu Glu Thr Leu Lys Gln Val Ile Glu  
 115 120 125  
 Val Phe Asn Ala Ser Cys Leu Ser Tyr Val Pro Glu Lys Gly Thr Val  
 130 135 140  
 Gly Ala Ser Gly Asp Leu Ala Pro Leu Ser His Leu Ala Leu Gly Leu  
 145 150 155 160  
 Ile Gly Glu Gly Lys Met Trp Ser Pro Lys Ser Gly Trp Ala Asp Ala  
 165 170 175  
 Lys Tyr Val Leu Glu Ala His Gly Leu Lys Pro Ile Val Leu Lys Pro  
 180 185 190  
 Lys Glu Gly Leu Ala Leu Ile Asn Gly Thr Gln Met Ile Thr Ser Leu  
 195 200 205  
 Gly Cys Glu Ala Val Glu Arg Ala Ser Ala Ile Ala Arg Gln Ala Asp  
 210 215 220  
 Ile Val Ala Ala Leu Thr Leu Glu Val Leu Lys Gly Thr Thr Lys Ala  
 225 230 235 240  
 Phe Asp Thr Asp Ile His Ala Pro Val Arg Pro His Arg Gly Gln Ile  
 245 250 255  
 Glu Val Ala Phe Arg Phe Arg Ser Leu Leu Ser Asp Ser Glu Ile Ala  
 260 265 270  
 Glu Ser His Arg Phe Cys Asp Gly Arg Val Gln Asp Ala Tyr Thr Leu  
 275 280 285  
 Arg Cys Cys Pro Gln Val His Gly Val Val Asn Asp Thr Ile Ala Phe  
 290 295 300  
 Val Lys Asp Ile Ile Thr Thr Glu Leu Asn Ser Ala Thr Asp Asn Pro  
 305 310 315 320  
 Met Val Phe Ala Ser Gly Glu Thr Ile Ser Gly Gly Asn Phe His Gly  
 325 330 335  
 Glu Tyr Pro Ala Lys Ala Leu Asp Tyr Leu Ala Ile Gly Val His Glu  
 340 345 350

033344-01801

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<400> 62
Met Ala Ser Met Asn Ala Leu Thr Leu Thr Pro Gly Thr Leu Thr Leu
  1              5              10              15
Ala Gln Leu Arg Gln Val Trp Gln Gln Pro Leu Gln Leu Thr Leu Asp
      20              25              30
Glu Ser Ala His Glu Ala Ile Asn Asp Ser Val Ala Cys Val Glu Ala
      35              40              45
Ile Val Ala Glu Gly Arg Thr Ala Tyr Gly Ile Asn Thr Gly Phe Gly
      50              55              60
Leu Leu Ala Gln Thr Arg Ile Ala Thr His Asp Leu Glu Asn Leu Gln
      65              70              75              80

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Arg Ser Leu Val Leu Ser His Ala Ala Gly Val Gly Glu Pro Leu Asp  
                     85                    90                    95  
 Asp Asp Ile Val Arg Leu Met Met Val Leu Lys Ile Asn Ser Leu Ala  
                     100                    105                    110  
 Arg Gly Phe Ser Gly Ile Arg Leu Ser Val Ile Gln Ala Leu Ile Ala  
                     115                    120                    125  
 Leu Val Asn Ala Gly Val Tyr Ser Val Asp Pro Ala Lys Gly Ser Val  
                     130                    135                    140  
 Gly Ala Ser Gly Asp Leu Ala Pro Leu Ala His Met Ser Leu Thr Leu  
                     145                    150                    155                    160  
 Leu Gly Glu Gly Lys Ala Arg Asp Tyr Arg Gly Glu Trp Leu Pro Ala  
                     165                    170                    175  
 Ala Thr Ala Leu Gln Lys Ala Gly Leu Ala Pro Val Thr Leu Ala Ala  
                     180                    185                    190  
 Lys Glu Gly Leu Ala Leu Leu Asn Gly Thr Gln Ala Ser Thr Ala Phe  
                     195                    200                    205  
 Ala Leu Arg Gly Leu Phe Glu Ala Glu Asp Leu Phe Ala Ser Ala Val  
                     210                    215                    220  
 Val Cys Gly Ala Leu Thr Thr Glu Ala Val Leu Gly Ser Arg Arg Pro  
                     225                    230                    235                    240  
 Phe Asp Ala Arg Ile His Glu Pro Val Arg Gly Gln Arg Gly Gln Ile  
                     245                    250                    255  
 Asp Ala Ala Ala Leu Phe Arg His Val Leu Thr Asp Thr Ser Ala Ile  
                     260                    265                    270  
 Ala Ser His His Asn Cys Asp Gly Lys Val Gln Asp Pro Tyr Ser Leu  
                     275                    280                    285  
 Arg Cys Gln Pro Gln Val Met Gly Ala Cys Leu Thr Gln Met Arg Gln  
                     290                    295                    300  
 Val Ala Glu Val Leu Leu Val Glu Ser Asn Ala Val Ser Asp Asn Pro  
                     305                    310                    315                    320  
 Leu Val Phe Ala Ala Asn Glu Met Val Phe Arg Gly Asn Phe His Ala  
                     325                    330                    335  
 Glu Pro Val Ala Met Ala Ala Asp Asn Leu Ala Leu Ala Ile Ala Glu  
                     340                    345                    350  
 Ile Gly Ala Leu Ser Glu Arg Arg Ile Ala Leu Met Met Asp Lys His  
                     355                    360                    365  
 Met Ser Gln Asp Leu Pro Pro Phe Leu Val Arg Asn Gly Gly Val Asn  
                     370                    375                    380

09033745 071501

Ser Gly Phe Met Ile Ala Gln Val Thr Ala Ala Ala Leu Ala Ser Glu  
385 390 395 400

Asn Lys Gly Leu Cys His Pro Thr Ser Val Asp Lys Ile Pro Pro Ser  
405 410 415

Ala Asn Gln Glu Asp His Val Ser Met Ala Pro Ala Ala Gly Arg Arg  
420 425 430

Leu Trp Glu Met Ala Gly Asn Thr Arg Gly Val Leu Ala Val Glu Trp  
435 440 445

Leu Ala Ala Cys Gln Gly Ala Asp Leu Arg Asp Gly Leu Thr Ser Ser  
450 455 460

Pro Leu Leu Glu Gln Ala Arg Gln Ser Cys Gly Glu Gln Val Ala His  
465 470 475 480

Tyr Asp Asp Asp Arg Phe Phe Ala Pro Asp Ile Glu Ala Ala Ile Ser  
485 490 495

Leu Leu Asn Lys Gly Ser Leu Val Gly Leu Leu Pro Ala Phe Leu Pro  
500 505 510

Ala

<210> 63

<211> 513

<212> PRT

<213> Rhizobium meliloti

<400> 63

Met Ala Ser Ala Met Gly Glu Met Ile Ser Leu Asp Gly Pro Leu Thr  
1 5 10 15

Trp Arg Glu Ile Ala Ser Ile Ala Glu Gly Ala Ser Leu Asp Leu Ser  
20 25 30

Gly Pro Ala Arg Leu Arg Ile Ala Gln Ala Arg Arg Ile Val Asp Ala  
35 40 45

Leu Val Glu Arg Gly Ile Arg Gly Tyr Gly Ile Asn Thr Gly Val Gly  
50 55 60

Ala Leu Cys Asp Val Ile Ile Ser Arg Glu Asn Gln Gln Ala Leu Ser  
65 70 75 80

Arg Asn Ile Ile Leu Ser His Ala Cys Gly Val Gly Asp Pro Leu Gly  
85 90 95

Arg Val Glu Ala Arg Ala Val Met Ala Ala Gln Ile Ala Asn Leu Thr  
100 105 110

His Gly Tyr Ser Gly Val Arg Val Glu Thr Ala Glu Met Leu Leu Ala  
115 120 125

0933715.071804

Leu	Leu	Asn	Ala	Asp	Ile	Ile	Pro	Leu	Ile	Pro	Ser	Arg	Gly	Ser	Val
130						135					140				
Gly	Tyr	Ser	Gly	Asp	Leu	Ala	Pro	Leu	Thr	His	Ala	Ala	Leu	Val	Leu
145					150					155					160
Ile	Gly	His	Gly	Ser	Ala	Met	Gln	Gly	Thr	Glu	Arg	Leu	Ser	Gly	Ala
				165					170					175	
Asp	Ala	Leu	Phe	Ala	Arg	Leu	Gly	Leu	Ala	Pro	Leu	Arg	Leu	Glu	Ala
			180					185					190		
Lys	Glu	Gly	Leu	Ser	Leu	Val	Asn	Gly	Thr	Pro	Cys	Ala	Thr	Gly	Leu
		195					200					205			
Ala	Ala	Leu	Ala	Leu	Ala	Arg	Thr	Glu	Arg	Leu	Phe	Ala	Trp	Ala	Asp
	210					215					220				
Ala	Ala	Ala	Ala	Met	Thr	Tyr	Glu	Ala	Asn	Leu	Gly	Ser	Gln	Ala	Asn
225					230					235					240
Ala	Phe	Ala	Glu	Leu	Pro	Leu	Ala	Leu	Arg	Gln	Ser	Pro	Gly	Leu	Ser
				245					250					255	
Ala	Val	Gly	Glu	Gly	Leu	Arg	Asp	Trp	Leu	Ala	Asp	Ser	Pro	Met	Leu
			260					265					270		
Ala	Gly	His	Arg	Thr	Ala	Gly	Thr	Arg	Thr	Gln	Asp	Pro	Leu	Ser	Leu
		275					280					285			
Arg	Ala	Val	Pro	Gln	Val	His	Gly	Ala	Ala	Arg	Asp	Ala	Phe	Gly	Gln
	290					295					300				
Val	Ala	Glu	Ile	Val	Asp	Arg	Glu	Leu	Ala	Ser	Val	Thr	Asp	Asn	Pro
305					310					315					320
Ala	Val	Ala	Gly	Ser	Pro	Glu	Val	His	Ser	Gln	Ala	His	Ala	Val	Gly
				325					330					335	
Ala	Ala	Leu	Gly	Leu	Ala	Met	Asp	Ser	Leu	Ala	Val	Ala	Val	Ala	Glu
			340					345					350		
Val	Ala	Ala	Ile	Ser	Glu	Arg	Arg	Ile	Asp	Arg	Leu	Val	Asn	Pro	Leu
		355					360					365			
Val	Ser	Arg	Gly	Leu	Pro	Ala	Phe	Leu	Ala	Gly	Asp	Ser	Gly	Val	Ser
	370					375					380				
Ser	Gly	Phe	Met	Ile	Ala	Gln	Tyr	Thr	Ala	Ala	Ala	Leu	Val	Ala	Glu
385					390					395					400
Asn	Arg	Arg	Leu	Ala	Ala	Pro	Ala	Ser	Leu	Asp	Gly	Gly	Ile	Thr	Ser
				405					410					415	
Ala	Leu	Gln	Glu	Asp	Met	Leu	Thr	His	Ala	Thr	Pro	Ala	Ala	Trp	Lys
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<212> PRT
<213> Halobacterium sp.

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Asp Asp Val Ile Ala Val Ala Arg His Glu Ala Arg Ile Ser Ile Ser
          20          25          30
Pro Gln Val Leu Glu Glu Leu Ala Ser Val Arg Ala His Ile Asp Ala
          35          40          45
Leu Ala Ser Ala Asp Thr Pro Val Tyr Gly Ile Ser Thr Gly Phe Gly
 50          55          60
Ala Met Ser Asp Thr Arg Ile Asp Ala Ala Asp Arg Glu Ala Leu Gln
 65          70          75          80
Ala Asn Leu Val Arg Ser His Ala Ala Gly Ala Gly Ser Glu Leu Asp
          85          90          95
Thr Ala Ala Val Arg Ala Leu Leu Val Thr Arg Leu Asn Ala Leu Ala
          100          105          110
Lys Gly Tyr Ser Gly Ile Arg Glu Arg Val Leu Asp Val Leu Val Gly
          115          120          125
Leu Leu Asn Glu Gly Val His Pro Val Val Pro Ser Arg Gly Ser Leu
          130          135          140
Gly Ala Ser Gly Asp Leu Ala Pro Leu Ala His Met Ser Arg Val Leu
145          150          155          160
Ile Gly Glu Gly Gln Ala Thr Asp Val Ala Gly Glu Arg Met Pro Ala
          165          170          175

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Ala Glu Ala Leu Ala Ala Ala Asp Leu Glu Pro Val Thr Leu Gln Ala  
 180 185 190  
 Lys Glu Gly Leu Ala Leu Ile Asn Gly Thr Gln Leu Thr Thr Gly Val  
 195 200 205  
 Ala Ala Leu Ala Leu Val Asp Ala Glu Arg Val Leu Arg Ser Ala Asp  
 210 215 220  
 Thr Ala Gly Ala Leu Thr Thr Glu Val Thr Met Ser Thr Thr Ala Ser  
 225 230 235 240  
 Cys Ala Pro Ala Ile His Glu Pro Val Arg Pro His Asp Gly Gln Ala  
 245 250 255  
 Val Ser Ala Arg His Ile Arg Asn Leu Thr Ala Gly Ser Glu Val Leu  
 260 265 270  
 Asp His His Arg Asp Cys Asp Gly Arg Val Gln Asp Ala Tyr Ser Ile  
 275 280 285  
 Arg Cys Leu Pro Gln Val His Gly Ala Val Arg Asp Ala Leu Asp His  
 290 295 300  
 Leu Arg Ala Ala Val Ala Thr Glu Leu Asn Ser Ala Thr Asp Asn Pro  
 305 310 315 320  
 Leu Val Phe Pro Ser Gly Thr Val Val Ser Gly Gly Asn Phe His Gly  
 325 330 335  
 Glu Val Leu Ala Leu Arg Leu Gly Tyr Ala Ala Ser Ala Leu Ala Glu  
 340 345 350  
 Leu Ala Ala Ile Ser Glu Arg Arg Thr Asp Arg Leu Leu Asn Pro Glu  
 355 360 365  
 Thr Gln Glu Pro Leu Glu Pro Phe Leu Ala Pro Asp Ser Gly Leu His  
 370 375 380  
 Ser Gly Leu Met Ile Pro Gln Tyr Thr Ala Ala Ser Leu Val Asn Asp  
 385 390 395 400  
 Leu Arg Ser Leu Gly Gln Pro Ala Thr Leu Asp Asn Ala Ser Val Ser  
 405 410 415  
 Gly Ala Gln Glu Asp His Val Ser Met Ser Ala Gly Ala Ala Tyr Asn  
 420 425 430  
 Phe Arg Glu Ala Val Glu Lys Ala Ala Thr Val Val Gly Val Glu Leu  
 435 440 445  
 Leu Cys Gly Ala Gln Gly Arg Glu Phe Leu Asp Pro Leu Ala Leu Gly  
 450 455 460  
 Ala Gly Thr Ala Ala Ala Tyr Asp Leu Val Arg Ser Glu Val Ser Glu  
 465 470 475 480

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Asp Leu Arg Asn Leu Tyr Thr Ser Ala Asp Ile Thr Ala Ala Leu Ser  
210 215 220

Leu Glu Ala Leu Leu Gly Thr Asp Lys Val Leu Ala Pro Glu Leu His  
 225 230 235 240  
 Ala Ile Arg Pro His Pro Gly Gln Gly Val Ser Ala Asp Asn Met Ser  
 245 250 255  
 Arg Val Leu Ala Gly Ser Gly Leu Thr Gly His His Gln Asp Asp Ala  
 260 265 270  
 Pro Arg Val Gln Asp Ala Tyr Ser Val Arg Cys Ala Pro Gln Val Asn  
 275 280 285  
 Gly Ala Gly Arg Asp Thr Leu Asp His Ala Ala Leu Val Ala Gly Arg  
 290 295 300  
 Glu Leu Ala Ser Ser Val Asp Asn Pro Val Val Leu Pro Asp Gly Arg  
 305 310 315 320  
 Val Glu Ser Asn Gly Asn Phe His Gly Ala Pro Val Ala Tyr Val Leu  
 325 330 335  
 Asp Phe Leu Ala Ile Val Ala Ala Asp Leu Gly Ser Ile Cys Glu Arg  
 340 345 350  
 Arg Thr Asp Arg Leu Leu Asp Lys Asn Arg Ser His Gly Leu Pro Pro  
 355 360 365  
 Phe Leu Ala Asp Asp Ala Gly Val Asp Ser Gly Leu Met Ile Ala Gln  
 370 375 380  
 Tyr Thr Gln Ala Ala Leu Val Ser Glu Met Lys Arg Leu Ala Val Pro  
 385 390 395 400  
 Ala Ser Ala Asp Ser Ile Pro Ser Ser Ala Met Gln Glu Asp His Val  
 405 410 415  
 Ser Met Gly Trp Ser Ala Ala Arg Lys Leu Arg Thr Ala Val Asp Asn  
 420 425 430  
 Leu Ala Arg Ile Val Ala Val Glu Leu Tyr Ala Ala Thr Arg Ala Ile  
 435 440 445  
 Glu Leu Arg Ala Ala Glu Gly Leu Thr Pro Ala Pro Ala Ser Glu Ala  
 450 455 460  
 Val Val Ala Ala Leu Arg Ala Ala Gly Ala Glu Gly Pro Gly Pro Asp  
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 485 490 495  
 Gly Arg Leu Val Ala Ala Val Glu  
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<210> 66  
 <211> 502  
 <212> PRT

FOBT'0"54ZEE660

<213> Corynebacteriaceae sp.

<400> 66

Ile	Thr	Leu	Gly	Leu	Ser	Gly	Ala	Thr	Ala	Asp	Asp	Val	Ile	Ala	Val
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Ala	Arg	His	Glu	Ala	Arg	Ile	Ser	Ile	Ser	Pro	Gln	Val	Leu	Glu	Glu
			20					25					30		
Leu	Ala	Ser	Val	Arg	Ala	His	Ile	Asp	Ala	Leu	Ala	Ser	Ala	Asp	Thr
		35					40					45			
Pro	Val	Tyr	Gly	Ile	Ser	Thr	Gly	Phe	Gly	Ala	Leu	Ala	Thr	Arg	His
	50					55					60				
Ile	Ala	Pro	Glu	Asp	Arg	Ala	Lys	Leu	Gln	Arg	Ser	Leu	Ile	Arg	Ser
65					70					75					80
His	Ala	Ala	Gly	Met	Gly	Glu	Pro	Val	Glu	Arg	Glu	Val	Val	Arg	Ala
				85					90					95	
Leu	Met	Phe	Leu	Arg	Ala	Lys	Thr	Leu	Ala	Ser	Gly	Arg	Thr	Gly	Val
			100					105					110		
Arg	Pro	Val	Val	Leu	Glu	Thr	Met	Val	Gly	Met	Leu	Asn	Ala	Gly	Ile
		115					120					125			
Thr	Pro	Val	Val	Arg	Glu	Tyr	Gly	Ser	Leu	Gly	Cys	Ser	Gly	Asp	Leu
	130					135					140				
Ala	Pro	Leu	Ser	His	Cys	Ala	Leu	Val	Leu	Met	Gly	Glu	Gly	Glu	Ala
145					150					155					160
Thr	Asp	Ala	His	Gly	Asp	Ile	Arg	Pro	Val	Pro	Glu	Leu	Phe	Ala	Glu
				165					170					175	
Ala	Gly	Leu	Thr	Pro	Val	Glu	Leu	Ala	Glu	Lys	Glu	Gly	Leu	Ala	Leu
			180					185					190		
Val	Asn	Gly	Thr	Asp	Gly	Met	Leu	Gly	Gln	Leu	Ile	Met	Ala	Leu	Ala
		195					200					205			
Asp	Leu	Asp	Glu	Leu	Leu	Asp	Ile	Ala	Asp	Ala	Thr	Ala	Ala	Met	Ser
	210					215					220				
Val	Glu	Ala	Gln	Leu	Gly	Thr	Asp	Gln	Val	Phe	Arg	Ala	Glu	Leu	His
225					230					235				240	
Glu	Pro	Leu	Arg	Pro	His	Pro	Gly	Gln	Gly	Arg	Ser	Ala	Gln	Asn	Met
				245					250					255	
Phe	Ala	Phe	Leu	Ala	Asp	Ser	Pro	Ile	Val	Ala	Ser	His	Arg	Glu	Gly
			260					265					270		
Asp	Gly	Arg	Val	Gln	Asp	Ala	Tyr	Ser	Leu	Arg	Cys	Ser	Pro	Gln	Val
		275					280					285			

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Thr Gly Ala Ala Arg Asp Thr Ile Ala His Ala Arg Leu Val Ala Thr  
 290 295 300  
 Arg Glu Leu Ala Ala Ala Ile Asp Asn Pro Val Val Leu Pro Ser Gly  
 305 310 315 320  
 Glu Val Thr Ser Asn Gly Asn Phe His Gly Ala Pro Val Ala Tyr Val  
 325 330 335  
 Leu Asp Phe Leu Ala Ile Ala Val Ala Asp Leu Gly Ser Ile Ala Glu  
 340 345 350  
 Arg Arg Thr Asp Arg Met Leu Asp Pro Ala Arg Ser Arg Asp Leu Pro  
 355 360 365  
 Ala Phe Leu Ala Asp Asp Pro Gly Val Asp Ser Gly Met Met Ile Ala  
 370 375 380  
 Gln Tyr Thr Gln Ala Gly Leu Val Ala Glu Asn Lys Arg Leu Ala Val  
 385 390 395 400  
 Pro Ala Ser Val Asp Ser Ile Pro Ser Ser Ala Met Gln Glu Asp His  
 405 410 415  
 Val Ser Leu Gly Trp His Ala Ala Arg Lys Leu Arg Thr Ser Val Ala  
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 Asn Leu Arg Arg Ile Leu Ala Val Glu Met Leu Ile Ala Gly Arg Ala  
 435 440 445  
 Leu Asp Leu Arg Ala Pro Leu Lys Pro Gly Pro Ala Thr Gly Ala Val  
 450 455 460  
 Leu Glu Val Leu Arg Ser Lys Val Ala Gly Pro Gly Gln Asp Arg Phe  
 465 470 475 480  
 Leu Ser Ala Glu Leu Glu Ala Ala Tyr Asp Leu Leu Ala Asn Gly Ser  
 485 490 495  
 Val His Lys Ala Leu Glu  
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